

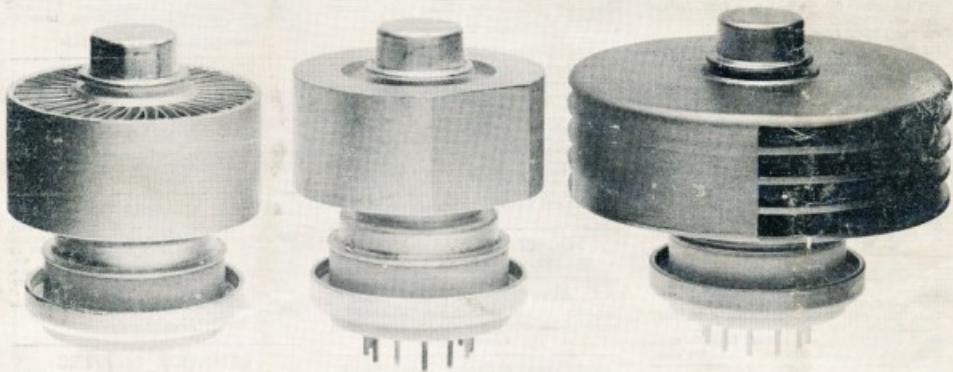
amateur radio

Vol. 39, No. 11

NOVEMBER, 1971

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COVER STORY

The Eimac Division of Varian recently released three high-mu triodes—the 8873, 8874 and 8875. They are compact, external-anode, ceramic-metal triodes intended for use in zero-bias class B amplifiers in audio or radio frequency applications. Further details may be obtained from Varian Pty. Ltd., 82 Christie St., St. Leonards, N.S.W., 2065. (Additional descriptions appeared in "Ham Radio" for January 1971.)

FEDERAL COMMENT:

THE SPACE CONFERENCE—GENEVA 1971

In the long term the World Administrative Radio Conference for Space Telecommunications of the International Telecommunications Union held in Geneva from 7th June to 15th July, 1971, may be found to be one of the most significant events for the Amateur Service in recent years. In the September issue of "Amateur Radio" a report on the proceedings and outcome of the Conference was published. I think it is now appropriate to examine the results of that Conference and, at the same time, to offer some comment on the implications flowing from it so far as they relate to the Amateur Service.

Previously, the Amateur Service has been defined in the I.T.U. Radio Regulations as a "service of self-training intercommunication and technical investigations carried on by Amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest". No alteration was made to this definition, but the Conference did adopt the definition of a new service, the "Amateur Satellite Service" in the following terms, "a radio communication service using space stations on earth satellites for the same purposes as those of the amateur service".

At first glance, this definition would appear to be an expression of convenience for use in footnotes. However, the significance of the adoption of this definition is far better than that. Many provisions of the Radio Regulations apply to the "Space Service" which is in turn defined as a "radio communication service". Therefore, as the Amateur Satellite Service is by definition a radio communication service, the doubt that has existed in the past as to the application of these provisions to Amateur Satellites is removed.

In my mind, even more significant than the result of the conference so far as it affected the Amateur Service was the opposition from so many countries to the Amateur Service. It is abundantly clear that the Amateur Service was supported by Australia as well as New Zealand, the United Kingdom, the United States of America, Canada, West Germany and other countries. The issue affecting the Amateur Service that produced so much opposition was the question as to whether or not Amateur

Satellites would be permitted in the Amateur shared bands. The countries that vociferously opposed Amateur Satellites in shared bands included Sweden, Norway, France, Switzerland, Portugal, U.S.S.R., Mexico, Greece, Spain, Netherlands, Italy, India and other countries.

We are fortunate that we enjoy the support of our administration. Comparisons with certain other countries must lead us to the conclusion that the Amateur Service, at least in some of those countries, does not enjoy a similar rapport.

The proposal to permit Amateur Satellites in shared bands had been meticulously investigated and recommended by the C.C.I.R., the I.T.U.'s technical advisory arm.

Of course the W.I.A. was particularly concerned about the 2 metre and 70 centimetre bands—the two bands that it was planned that the A.O.B. translator project would use. Despite some opposition, the principle of the unrestricted use by the Amateur Satellite Service of the exclusive bands, was accepted by the conference. This, of course, covered the frequency band 144–146 MHz., the worldwide two metre allocation.

However, there is no Amateur allocation between 146 MHz. and 24 GHz. that is not a shared band. In the final outcome, use of the segment 435–438 MHz. by the Amateur Satellite Service is permitted, thanks to the excellent lobbying of the I.A.R.U. team which saved the day at the very last minute. For the sake of completeness, it is useful to restate the relevant footnote to that segment:

"320A. In the band 435–438 MHz. the amateur satellite service may be authorised on condition that harmful interference shall not be caused to other services operating in accordance with the table of frequency allocations. Administrations authorising such use shall ensure that any harmful interference caused by emissions from amateur satellites is immediately eliminated."

Even this footnote was the subject of opposition from Indonesia, Singapore and to a lesser extent, Malaysia.

No doubt in a number of cases, the opposition to the use of the shared Amateur bands by the Amateur Satellite Service, can be ascribed to genuine fears of harmful interference, but no doubt there are many other reasons that influenced those countries that opposed the Amateur position. "It Seems To Us" in "QST" of August 1971 puts the matter very clearly: "In the first weeks of the Conference it became apparent that a number of societies in other countries had not done their 'homework' of liaison with authorities."

The fact that at the last Plenary Meeting, the footnote I have quoted above in relation to the segment 435–438 MHz., was inserted into the frequency table, may result, one ventures to suggest, in many administrations giving special scrutiny to the Amateur Service. In addition, other services which failed to achieve anything at all, or at best very little, such as the Maritime Service, which failed totally to secure any frequencies for space communications, may likewise decide to carefully examine the position of the Amateur Service.

In my view, the Amateur Service over the next few years, could face a questioning of its position and perhaps its very existence, by a number of administrations and other services. It is clear that the Amateur Service as a whole must be able to demonstrate the usefulness to which it puts its frequencies. This, in itself is a complete justification for the Wireless Institute of Australia continuing to foster activities such as Project Australis.

Furthermore, the irresponsible use by any Amateur of the frequencies allocated to the Amateur Service cannot be other than detrimental to the whole service in respect of its allocations and privileges. The final results of the Conference may be less than we sought but were the minimum for which we hoped. The result also may be that the Amateur Service will, in the eyes of many, be on trial. Each of us, by our support of those activities that are truly useful, and by the responsible use of our privileges, can ensure that we do not place the future in jeopardy.

MICHAEL J. OWEN,
Federal President, W.I.A.

(Also refer to page 9 of September "A.R." for previous details.—Ed.)

DRAKE 2-B RECEIVER ON TOP BAND*

NOTES ON A SIMPLE MODIFICATION

R. L. GLAISHER, G6LX

The Drake 2-B was first introduced in 1959 and although it has been superseded by later models, in the writer's view it is still one of the best of the post-war Amateur receivers for s.s.b. and c.w. use. In addition to coverage of the 3.5 to 28 MHz. Amateur bands, it has a built-in facility which permits, with the use of extra crystals, reception on five extra bands each 600 KHz. wide anywhere in the range 3 to 32 MHz. It is this facility which can be used

mer. At first sight it might be thought that the addition of such a large capacity in shunt with the condensers already in circuit would have detrimental effects of the Q of the tuned circuits in the r.f. stage. In practice this was not found to be a problem as the pre-selector can be tuned over the frequency range required and more than sufficient gain is available from the r.f. stage to blanket the noise from the succeeding mixer stages.

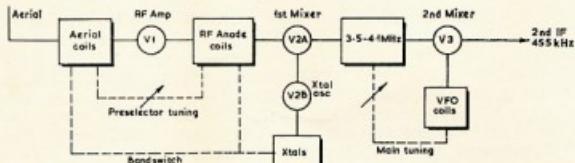


Fig. 1.—Block diagram of the Drake 2-B Receiver, showing r.f. and mixer arrangements—see text.

to extend the coverage to include the 160 metre band.

As will be seen by reference to the block diagram (Fig. 1), the receiver is a multiple-conversion superhet having a basic tuning range of 3.5 to 4.1 MHz. A crystal oscillator and mixer stage is switched into circuit for the Amateur bands 7 to 28 MHz, and for the five extra bands in the spectrum above 4.1 MHz. The grid and anode circuits of the r.f. stage are tuned independently of the main frequency control by the use of a separate pre-selector control comprising L/C circuits which resonate at 7 MHz. \pm 2 MHz. Coverage of the other bands and frequencies is obtained by the switching of capacitive or inductive shunts across the pre-selector coils to raise or lower their inductance.

To receive 160 metres, triple-conversion is used, as on the 7 to 28 MHz. bands. As the pre-selector circuits will only tune down to 3.3 MHz., it is necessary to add capacity so that they will resonate at 1.9 MHz. at mid-scale of the pre-selector tuning. This can be done by using the extra band "A" switch position to bring in capacitive shunts, which in conjunction with a suitable crystal fitted in the "A" socket, will provide the coverage required. By using band "A", the modification has no effect on the performance or the operation of the receiver on the other bands, as the shunts are only in circuit on 160 metres.

A total padding capacity of about 1500 pF. is required across each section of the pre-selector tuned circuits. This capacity is made up from a 0.001 uF. silver mica condenser in parallel with a 700 pF. compression-type mica trim-

CRYSTAL FREQUENCY

To convert the 1.8 to 2.0 MHz. signal frequency to fall within the range of the tunable i.f. (3.5 to 4.1 MHz.), the crystal oscillator has to operate between 1.7 and 2.1 MHz. for product mixing, or between 5.5 to 5.9 MHz. for difference mixing. At G6LX, a crystal frequency of 5.5 MHz. is used to obtain a coverage of 1.8 to 2.0 MHz. with the receiver tuned 3.7 to 3.5 MHz. Product mixing is not recommended, as apart from the problem of the oscillator being in the band in the 1.8 to 2.0 MHz. segment, there are difficulties with strong second-channel signals and in-band birdies. Using difference mixing, there

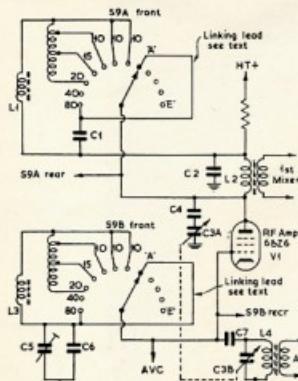


Fig. 2A.—Part of the r.f. stage circuit of the Drake 2-B before modification. Component values are as original—see handbook.

are no obvious spurious or second channel signals within the 1.8 to 2.0 MHz. band. It is suggested that a crystal having an exact multiple of 100 KHz. be used as this will provide a direct frequency read-out on the main tuning scale.

PRE-SELECTOR MODIFICATION

It is first necessary to identify the two switch wafers that are associated with the pre-selector input and output circuits and the connections to the wafers that correspond to switch positions "A" and "80". These wafers are the first two looking from the front panel and as wired have a linking lead between the connections for "A" and "80" (see Fig. 2A). The modification consists of removing these leads and wiring in the padding condensers (C1A, CT1A, C2A and CT2A) as shown in Fig. 2B. While there is sufficient room to mount the extra components on short brackets attached to the chassis, this

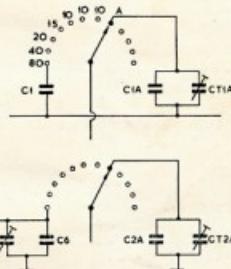


Fig. 2B.—The preselector modifications for Top band in the Drake 2-B. C1A, C2A = 0.001 uF. silver mica. CT1A, CT2A = 700 pF. compression-type trimmers—see text.

was not found to be necessary and the condensers and trimmers are wired directly between the switch contacts and the 80 metre shunts using short lengths of 18 gauge tinned copper wire. If brackets are used, it should be remembered that most types of compression trimmers are constructed so that one side is at earth potential and insulated spacers will be required between the trimmers and the mounting brackets.

ALIGNMENT

Once the pre-selector modifications have been completed and a crystal of the correct frequency inserted into crystal socket "A", the only thing that remains is to adjust the trimmers CT1A and CT2A in order to resonate the pre-selector tuned circuits to 160 metres. This is a very simple adjustment which can be done without the use of a signal generator or other test equipment.

(Continued on Page 9)

* Reprinted from "The Short Wave Magazine," March, 1971.

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This is a large double-sided circuit board housing:

- Injection crystal oscillator,
- Injection balanced mixer,
- R.F. amplifier,

Transmitter balanced mixer.

This complete section is readily removable for maintenance purposes.

2. LF. Modem

A second relatively large printed circuit board houses:

- Receive balanced mixer,
- Transmit balanced modulator,
- 9 MHz. filter and associated matching networks,
- Two i.f. amplifiers,
- A.m. and sideband detector,
- A.g.c. system.

3. 10-Watt Broad-band Driver

4. Frequency Counter and Digital Display.

5. 6-5 MHz. VFO.

The remaining modules are contained on separate plug-in boards. These are:

6. 10 Volt Power Regulator,

7. Audio Amplifier,

8. 9 MHz. Carrier Oscillator,

9. Microphone Amp., Vox/Anti-Vox,

10. Digital Oscillator and Balanced Mixer,

11. 100 KHz. Clock Oscillator and Logic Generator.

All circuit boards are plated fibre-glass using gold plated edge connectors, where applicable.

A.L.C.

The a.l.c. system uses the grid current of the final tube to generate a negative voltage which is applied to the first i.f. amplifier. Whilst the main function of the a.l.c. system is to prevent overdrive of the transmitter, it also performs the function of a speech compressor owing to its very fast time constant, thus allowing approximately 15 to 20 dB. compression to be incorporated on transmit, if desired.

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A hot carrier diode ring mixer is used to ensure a minimal radiation of spurious emissions. This is a broadband device using toroidal transformers, therefore, no tuning is required.

MICROPHONE AMPLIFIER, VOX/ANTI-VOX SYSTEM

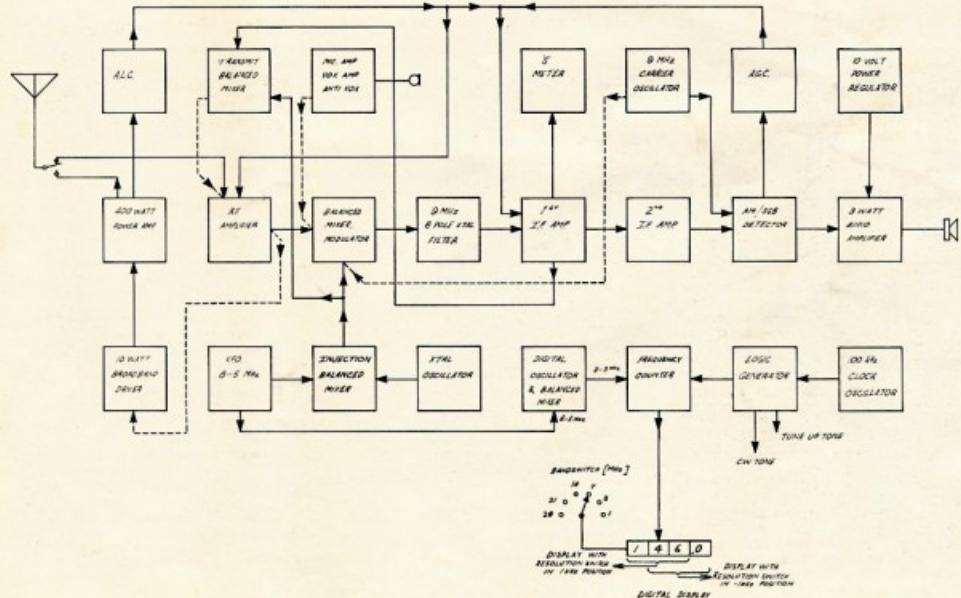
The microphone amplifier consists of a source follower driving an integrated circuit. The source follower input enables high impedance crystal or low impedance dynamic microphones to be used. The terminating resistor to suit the microphone is the only change required. There is adequate gain in the microphone amplifier to accommodate most dynamic, crystal and rocking armature microphones.

The vox amplifier consists of two transistors and a fast-acting voltage doubler deriving its input via the vox gain control from the output of the first stage of the microphone amplifier. The output of the voltage doubler is combined with the output of a second voltage doubler connected by the anti-vox control to the loudspeaker. These two voltages are out of phase and cancel prior to passing through a digital gating system and thus operating the vox relay. The vox delay is incorporated after the digital gating system which means it has no effect on the anti-vox operation. The system of vox/anti-vox gating used allows the vox to override the anti-vox, even when there is only a slight pause in the anti-vox signal, i.e. the pause between word syllables.

Four transistors, two integrated circuits, one FET and six diodes are used in this system which is self-contained on a single plug-in circuit board.

"S" METER

The "S" meter forms the dual function of "S" meter and transmit power monitor. On receive, the "S" meter is connected by a bridge circuit to the combined source voltages of the r.f. and first i.f. amplifiers. Both of these are a.g.c. controlled, giving a dynamic range on the "S" meter of approximately one microvolt to one volt. On transmit, the "S" meter is connected to a diode monitor on the transmitter r.f.



Block Diagram of the Acitron SSB-400.

output. A separate meter is used to indicate plate current of the power amplifier.

9 MHZ CARRIER OSCILLATOR

This unit consists of a series mode transistor oscillator and FET source follower. Diode switching allows the correct crystal to be selected when changing from normal to reverse sideband.

A.G.C.

The a.g.c. system uses a negative voltage derived from a voltage doubler and feeds in turn to the r.f. and first i.f. amplifiers, both units being dual gate FETs. This allows a large dynamic range prior to receiver overload and in actual practice the receiver will accept a signal from noise level to almost one volt before overload occurs.

10 VOLT POWER REGULATOR

The 10 volt power regulator supplies power to all stages of the transceiver with the exception of the audio output stage, transmitter p.a. and broad-band driver.

The supply consists of a two-stage emitter follower with short circuit protection supplied from a zener referenced voltage.

400 WATT POWER AMPLIFIER

The power amplifier consists of a YL1060 u.h.f. dual tetrode transmitting tube. This stage has a broad-band input and pi-coupler output. The valve is running approximately 800 watts p.e.p. in and delivering 400 watts p.e.p. out.

The power is slightly less on 10 metres. Approximately 1,800 volt (p.a.) and 400 volt (screen) supplies are used.

R.F. AMPLIFIER

This is a band switched r.f. amplifier consisting of a dual gate FET followed by an emitter follower. Tuning is electronically accomplished using diodes. The r.f. amplifier is used both on transmit and receive.

BALANCED MIXER -MODULATOR

One of the most interesting blocks in the transceiver is an integrated circuit balanced mixer which performs the dual function of receive balanced mixer and transmitter balanced modulator. While receiving, the input ports are connected to the r.f. amplifier and the injection balanced mixer. The output of the balanced mixer is fed via an emitter follower to the 9 MHz. crystal filter. On transmit, the input ports are changed over and the transmitter audio is fed to one port and the 9 MHz. carrier to the other. The unit then functions as a balanced modulator. The carrier suppression of the balanced modulator and filter combined is in the vicinity of 60 dB.

9 MHZ 8-POLE CRYSTAL FILTER

A 9 MHz. 8-pole crystal filter is used with a bandwidth of approximately 2.5 kHz. at the 6 dB. points, rising to only 4.1 kHz. at the 60 dB. points.

I.F. AMPLIFIERS

The first i.f. amplifier is used both on transmit and receive and consists

of a dual gate FET. It has a.g.c. applied on receive and a.l.c. on transmit.

The second i.f. amplifier also consists of a dual gate FET.

A.M./S.S.B. DETECTOR

The product detector used is a diode bridge detector and one leg of the bridge is opened when operating in the a.m. mode. A source follower connected to the output reduces the impedance to drive the audio amplifier, via the volume control.

THREE-WATT AUDIO AMPLIFIER

The three-watt amplifier consists of a pair of TO3 transistors, transformer coupled to the loudspeaker and driven by two small signal transistors.

TEN-WATT BROAD-BAND DRIVER

The 10-watt broad-band driver consists of a transformer coupled pair of v.h.f. strip-line transistors. These are driven by a single v.h.f. strip-line transistor. The complete unit is broad-band, from input to output, delivering approximately ten watts of drive to the power amplifier. This unit is contained on a separate circuit board mounted on a heat sink and does not require tuning.

V.F.O. 6-5 MHZ.

The v.f.o. consists of a permeability tuned FET Vacker oscillator followed by suitable buffering stages. The unit is completely enclosed in a metal box and is substantially free from vibration, making it particularly suitable for mobile use.



INJECTION BALANCED MIXER

The injection balanced mixer is once again an integrated circuit similar to the type used in the balance modulator. The input ports are connected to the 6.5 MHz. v.f.o. and the band-set crystal oscillator. The output of this is fed via broad-band tuned circuits (to reduce the possibility of spots on receive) to an emitter follower driving both the receive and transmit mixers.

CRYSTAL OSCILLATOR

This unit is a series overtone crystal oscillator followed by a FET source follower. The appropriate crystals being switched in when changing from band to band.

DIGITAL SYSTEM

As the v.f.o. is reverse tuning from 6 to 5 MHz., a balanced mixer is used to convert this to the 2 to 3 MHz. range. This is then applied to a conventional

frequency counter. The 8 MHz. crystal used in the digital oscillator is diode switched when changing from upper to lower sideband and in some cases when changing from band to band (depending on whether additive or subtractive mixing is used). This is achieved automatically due to the logic system, enabling the digital readout to display the exact carrier frequency, rather than the centre pass band frequency.

FREQUENCY COUNTER

The frequency counter consists of eleven dual in line integrated circuits comprising complete count and memory facilities and it drives a three-digit seven-segment gallium arsenide display. It has the facility to scale down and read to one extra digit (100 Hz.).

LOGIC GENERATOR

The logic generator performs the functions necessary to generate the var-

ious gate, set and re-set pulses, etc., for the frequency counter. It also generates tones for c.w. transmission and tuning purposes. Eight dual in line integrated circuits and two transistors are used in this section.

100 KHz. CLOCK OSCILLATOR

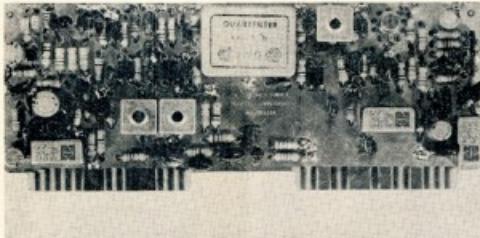
The 100 KHz. clock oscillator consists of a parallel mode 100 KHz. crystal. Twenty-one integrated circuits, five transistors and one FET are used in the complete digital readout system.

P.A. TUNING

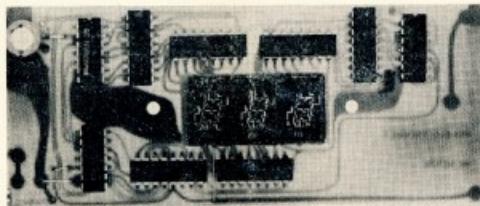
Before describing the tune-up system employed in the SSB-400, some comments are necessary on the tuning of s.s.b. transmitters in general.

It is a well known fact that an s.s.b. transmitter must be tuned at the full rated (p.e.p. value) input that it will be operating at on voice peaks in order

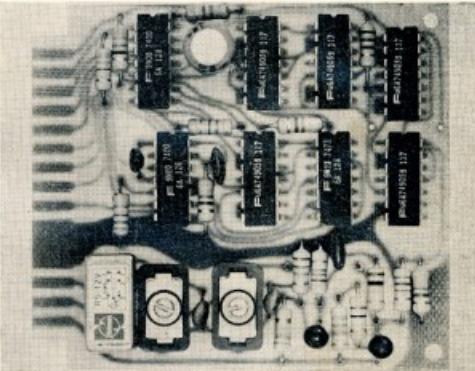
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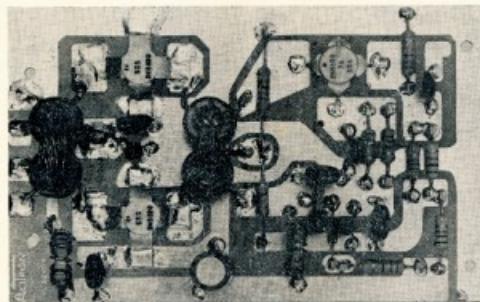
I.F. Modem.



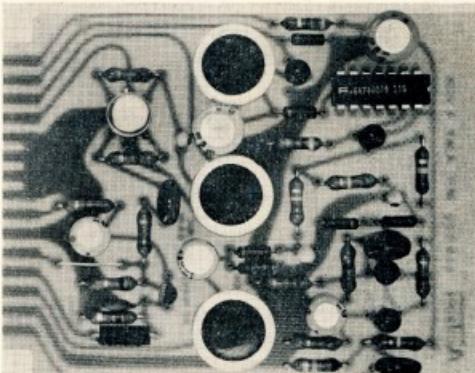
Frequency Counter and Digital Display Module.



100 KHz. Clock Oscillator and Logic Generator module.



10 Watt Broad-band Driver Module.



Microphone Amplifier, Vox/Anti-Vox Module.

A Tester for Field Effect Transistors*

A. G. THORBURN, G3WBT

The winter constructional programme at G3WBT included, for the first time, quite a few projects using field effect transistors, but because of a lack of knowledge and a lack of data on these devices, this FET tester was designed, constructed and found satisfactory in operation. This design is not the last word in FET testers, as simplicity and availability of parts in the stock (junk) box were important influences.

The design of such a tester should enable FET transfer characteristics to be ascertained so as to allow correct bias points to be determined and load lines drawn. From these, some understanding of FETs would be obtained and circuits using them could be laid out for efficient and effective use.

Further criteria of the design were ability to check N and P channel junction FETs, MOSFETs or IGFETs; depletion or enhancement modes, and the ability to attach the FET easily to the tester and accommodate the multiplicity of different orders of drain, source and gate connections.

THE CIRCUIT

Fig. 1 shows the circuit diagram, and Fig. 2 shows the front panel layout. The latter has three crocodile clips, not shown in the circuit diagram, to which the FET leads are attached; the correct connections for drain, source and gate being arrived at by insertion of the three miniature wander plugs in the appropriate sockets.

* Reprinted from "Radio Comm." July 1971.

Switch positions in the circuit diagram are shown for N channel junction FETs where the drain has positive polarity and the gate is negatively biased from 0v. to -6v. by means of RV1 with the 6v. zener in circuit, or to 9v. with S5 open. S5 must be open when the tester is not in use otherwise the 9v. PP3 will take current through the zener and R1 despite S2 being in the off position.

RV1 can be of very high resistance, as the gate, being reversed biased, takes no measurable current. S5 closed also allows RV1 to be calibrated in volts, 0 to 6, so no meter is required to read gate volts. When S5 is open the full 9v. is available if required. With enhancement mode MOSFETs or IGFETs there may be no drain current until application of gate volts bias.

For N channel MOSFETs with drain positive, the gate will be positive, the drain current increasing with increased positive bias. P channel MOSFETs require negative bias for current flow.

Depletion mode MOSFETs have current flow with zero bias, the N channel type decreasing drain current with negative bias and increasing drain current with positive bias. In this way depletion mode MOSFETs can operate from zero bias on application of either positive or negative bias, i.e. from zero bias a change either way changes drain current. The B1 switching takes care of all these possibilities in conjunction with RV1.

In the model shown, B1 is external to the tester, as is the separate a.c. p.s.u.

Fig. 1 shows B2 as 18v. from two PP9 or RR6 batteries in series. B2 and components to the right of the chain line in Fig. 1 can be built as a separate item as an alternative to the a.c. p.s.u.

OPERATION

To operate, all switches should be off and the wander plug positions checked that they are correct for the FET to be tested. S4 should be switched to the 500 ohm RV2 position, which should give 1.8v. maximum with an 18v. battery, and with a 30v. p.s.u. 3 v. maximum. For a junction FET, RV1 can be set half way and S3 meter switch

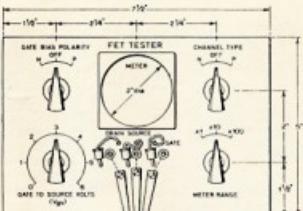


Fig. 2.—Front panel layout.

to 100 mA. For IGFETs a finger should be held across the gate and source crocodile clips to prevent any build-up of static until the bias is switched on. Switch on S2 before S1 so that bias is applied before drain-source volts. Increasing bias on junction FETs decreases drain current. The meter switch should of course be moved to ensure that some drain current is showing.

Manipulation of RV1, RV2 and RV3 in conjunction with S4, using the station multimeter to read drain to source voltage and tabulating drain current against drain to source volts at known gate to source bias volts, allows the FET's transfer characteristics to be plotted and curves filled in.

Fig. 3 shows results obtained on an N channel general purpose FET.

While 18v. should be all that is necessary for B2, as components were available in the junk box a variable p.s.u., 0-30v., Fig. 4, was made up. The

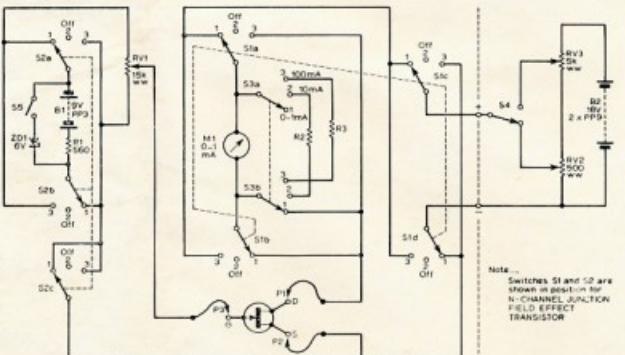


Fig. 1.—Tester circuit diagram. Switches S1 and S2 shown in position for "N" channel junction FET.

ZD1—6v. zener diode. Mullard BZY88-C6V2, AEI-LR62 or similar.
R1—560 ohm carbon.
R2—Meter shunt to suit 10 mA. f.s.d.
R3—Resistor to suit 100 mA. f.s.d.
RV1—20K or 25K ohm wire wound potentiometer (can be 20K or 25K ohm).
RV2—500 ohm wire wound potentiometer.
RV3—5,000 ohm wire wound potentiometer.
P1, 2, 3—Radio Spares miniature plugs and sockets (wander type).

S1—4-pole 3-way wafer.
S2—3-pole 3-way wafer.
S3—2-pole 3-way wafer (or single-pole 3-way).
S4—Single-pole.
S5—On/off.
M—0-1 mA. f.s.d. meter, preferably 100 divisions scale.
B1—PP3 9v.
B2—2 off PP9 18v., or see simple p.s.u. circuit.

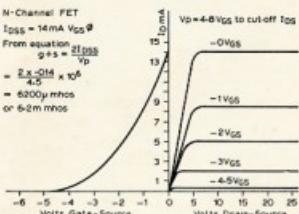


Fig. 3.—Transfer characteristics of N channel general purpose FET.

transformer was an ex-radio speaker output transformer for 15 ohm output. The 500 μ F capacitor is mainly to allow peak voltage to build up. Fig. 5 shows the voltage drop against current taken for this p.s.u., and is included as a matter of interest for those contemplating a similar type of p.s.u.

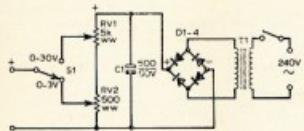


Fig. 4.—0-30V p.s.u. circuit diagram.

C1—500 μ F.
RV1—5k ohm wire wound potentiometer.
RV2—500 ohm wire wound potentiometer.
S1—Single-pole, 2-way switch.
D1-4—75V p.i.v. silicon rectifier diodes.
T1—20v. miniature mains (Radio Spares).
Terminals or sockets—2 off.

CONSTRUCTION

The tester shown is constructed in a $1\frac{1}{2}$ " wall wooden box with an $1\frac{1}{2}$ " thick paxolin panel. After marking out and drilling, a sheet of substantial plain white paper is placed over the finished drilled panel and all holes rubbed in. Hole centres are easily found to allow the paper to be marked up, using a suitable pair of compasses and pen for all necessary inscriptions. The panel is then lightly gummed and the paper placed in position. After allowing a period for drying out, the author used 2" wide Sellotape to cover the papered panel and wrap a little around the edges. The large holes can be cut radially before folding inwards and the small holes pierced with pen or pencil.

Assembly of the switches, variable resistors, etc., can then take place, the Sellotape protecting the panel while wiring and soldering takes place. RV1 is a linear wire wound potentiometer and the panel can be pre-marked 0 to 6v, as the input resistance is constant. It is advisable to subdivide the 0 to 1 division into either 10 or 5 further divisions.

It is not possible to divide out the sweep of RV2 and RV3 as the load here is not constant, as can be seen by Fig. 5, which, in a way, simulates the varying load presented by the FET drain current. The station multimeter across B2 input to the tester when in use shows this up as widely varying voltages at identical positions of RV3.

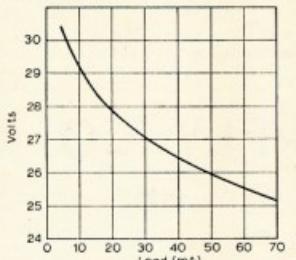


Fig. 5.—P.s.u. voltage drop against load in mA.

DRAKE 2-B RECEIVER

(Continued from Page 3)

The receiver bandswitch is set to 160 metres (band "A") and the pre-selector control to mid-scale. The main tuning control is set to the frequency that corresponds to 1.9 MHz, and the trimmers CT1A and CT2A carefully adjusted for maximum received noise without an aerial connected. If the receiver is fitted with the optional 100 KHz calibrator, this can be switched on and the trimmers adjusted for maximum S meter reading.

Correct adjustment of the trimmers can be checked by retuning to 1.8 MHz, and the pre-selector control adjusted for a noise peak (or maximum S meter reading on the calibrator signal). This peak should occur with the pre-selector at near maximum capacity (pre-selector dial near 3.5). A similar check at 2.0 MHz should provide a pre-selector peak at near minimum capacity (28 MHz. on the dial). Provided that the trimmers have been correctly set, tracking over the band will be satisfactory and the aerial can be connected. If it is found that the pre-selector will not peak at the band edges, or if there is an obvious difference in sensitivity over the band, this is a sure indication that the trimmers were not set correctly at 1.9 MHz. and further adjustment is required.

PERFORMANCE

A number of Drake 2-B receivers have been similarly modified for 160 metres, using the arrangement described. In every case the sensitivity throughout the band has compared favourably with that attainable on 80 metres. The G6LX receiver has been used extensively for Top Band DX working and by the Croydon N.F.D. Group, with excellent results.



OVERSEAS MAGAZINE INDEX

This month five magazines were available to us: 1. "Break-In," July; 2. "Q.C." Sept.; 3. "QST," July; 4. "Radio Communication," August; 5. "Short-Wave Magazine," July (1971 issues). Material available varied, as usual, with the accent upon amateur.

Antennas: An optimum performance array for 160, 80 and 40 metres, a Half-Wave DDRR Antenna; An Antenna for 75 metre WAS; The KTGCO Modified HT-18 Hy-Tower; A Rotatable Dipole for 20, 40 and 80 metres; A Cheap 10 metre Vertical, see key; The Ground Image Vertical; A Two-Stage Two-Tone Lightweight Portable Beam for 2 metres (3); Development of an All-Band Vertical (4).

Accessories: A Simple IC Keyer with weight control (3); Katsumi CW Monitor and Electronic Keyer, review (5).

General: A Second Look at Linear Integrated Circuits (3); A 20 MHz. Digital Frequency Meter using TTL ICs, Part 2 (4); Microwave Diodes (4); Modern Filter Design for the Radio Astronomer (4); The Solar Link (Amateur Radio Astronomer) (4).

Receiving: A Solid State Noise Blanker (3); A Tunable 440 MHz. FM Receiver (3); Heath Model SB-303 Receiver, review (3); An RF Noise Bridge and its uses (5); More about Satellite Reception, Part 3 (5).

Transmitting: A Power Bridge and SWR Indicator for 2 metres (3).

Other: Standard Frequency and Time Transmissions (1); Space Conference Interim Report (2).

—VK3ASC.

ACITRON SSB-400

(Continued from Page 7)

to obtain the maximum output consistent with the best linearity. For example, if a transmitter is operated at 400 watts p.e.p. r.f. output it can only be correctly adjusted when running at this level. If it is tuned up at a value below this level and the drive is then increased to full input, it will be substantially malfanned and most certainly not optimised for best linearity.

In order to meet the above, the following requirements have to be met:

- (a) A power supply capable of running with a continual two-tone input at the full p.e.p. rating, with little or no voltage drop;
- (b) A p.a. tube or tubes capable of standing the full p.e.p. rating for some time.

However, in practice allowing for 50% transmit/50% receive time, the actual duty cycle on speech wave forms is as little as 15% to 20%.

In summarising, it is sufficient to say that for normal operation of s.s.b. equipment, i.e. voice, we require valve and power supply capabilities far in excess of what is necessary simply to enable the transmitter to be correctly tuned.

The novel (patented) tune-up system employed in the SSB-400 overcomes this problem using a different technique. The system of tuning is accomplished by feeding a low-duty cycle wave form into the transmitter audio input. In practice, this consists of a tone burst, with a one to ten mark to space ratio, meaning that the transmitter is running during these bursts to its full rated input, but is only running an average power in the order of 10% of its maximum rating.

This in effect means that although the transmitter is running to its full rated p.e.p. input there is only one-tenth of the drain on both power supply and p.a. tube. This enables the operator to be relatively slow in carrying out the tune-up procedure and still have little possibility of damaging the final valve.

The price of the SSB-400 transceiver is \$750.



HY-Q ELECTRONICS TO MANUFACTURE IN SINGAPORE

Hy-Q Electronics Pty. Ltd., the Melbourne based quartz crystal manufacturers whose Frankston, Vic., plant is now operating at capacity, are to start manufacturing in Singapore.

Mr. T. A. Dineen, marketing director of Hy-Q, stated on his return from Singapore that the new operation, Hy-Q Electronics International Pte. Ltd., will be in production early in 1972 and that a new air-conditioned factory is already under construction.

Hy-Q Electronics will be joined in this venture by O'Connors Pty. Ltd., a Singapore based company with a 30% holding in the new company.

Mr. Dineen recently carried out a survey of East Asian markets, and with Mr. P. E. Cooper, chairman of Hy-Q Electronics, and Mr. G. Richards, managing director, concluded the negotiations with O'Connors and the Singapore Government.

BEWARE OF . . . CHAIN LETTERS

Another batch are in circulation. If you get one, tear it up!

STOCKTAKE CLEARANCE SALE

HIGH IMPEDANCE MICROPHONES

Ceramic press-to-talk, coiled cord	\$8 plus tax
Dynamic press-to-talk, coiled cord	\$10
Ceramic with switch, model SM52	\$3.50
Ceramic	\$3
Ceramic torpedo stand type	\$8

S.W.R. BRIDGES

Sansei Mini-Bridge, 2 kw.	\$8 plus tax
Sansei SE405 SWR/Field Strength	\$13

B. & W. COMPONENTS

Linear Amplifier G.G. Ferrite Filament Choke FL15	\$10 plus tax
Linear Amplifier Plate Choke, ceramic former	\$5.15
Sansei Xtal Cal., 25 and 100 KHz., transistors, self contained battery, very neat cabinet, compact	\$22

SWAN TRANSCEIVER POWER SUPP.

500 watt 12 volt DC Supply, suit most Transceivers	\$110 tax inc.
240 volt AC, with Speaker	\$110

SWAN HORNET ANTENNAS

TB-2 2 el. Triband, ex. heavy duty	\$100 plus tax
TB-3 3 el. Triband, ex. heavy duty	\$125
TB-4H 4 el. Triband, ex. heavy duty	\$171

GOTHAM SINGLE-BAND BEAMS

Y203 3 element 20 metre	\$45 plus tax
Y153 3 element 15 metre	\$31
Y104 4 element 10 metre	\$37
Y69 9 element 6 metre	\$59
Y212 12 element 2 metre	\$53

TUBES—U.S.A. G.E. COMPACTRON

6KD6, 6LQ6, 6HF5, 6JS6C, 6DQ5	\$5.86 plus tax
6JH8, 7360, 6GK6	\$3
Full range of tubes for all popular Transceivers.	

CRYSTALS

100 KHz. Cal. Crystals	\$5.50 plus tax
Small Ships freq. 2524, 2182, 6204, 2284 MHz., HC6U type	\$5.25

MISCELLANEOUS

Dow Key broad-band pre-amplifiers, 2 to 30 MHz.	\$10
Strain Insulators	\$0.26
All weather Co-ax Relay	\$16
Simplex Ceramic Trimmers	\$0.20
10 volt Zener Diodes	\$2
Dow Key Electronic TR Switch	\$12

Knobs, Power Diodes, Dow Key Relay Coils, 12 volt 30 amp. Silicon Diodes, OC35 Transistors, Swan Meters, ADY26, 2N1522, 2N1518 Power Transistors, push-pull 10K Switch Pots, Jabel Rotary Switches, 80x20x2 uF. Electro. 350v. wkg., 122 Vibrator Cartridges, 3-contact Mike Plugs and Jacks, PL259 Plugs, S259 Sockets, 50 uF. 500v. wkg., Electros., Swan S52 Sideband Kit, Cedar 455 KHz. Q Multiplier, Cedar CR45 Receiver, Hallicrafters 5 watt CB3A Transceiver.

"FRONTIER" TRANSCEIVERS

1200 Super GT Transceiver, five-band, 500 watts	\$525 tax inc.
500 Digital Transceiver, five-band, 500 watts	\$715 tax inc.
240 volt AC Supply and speaker for above	\$92
Super 3500 GT Linear Amplifier	\$314

W.F.S. ELECTRONIC SUPPLY CO.

12 BOWDEN STREET, NORTH PARRAMATTA, N.S.W., 2151

TELEPHONE 630-1621

AMATEUR RADIO CO-OPERATION-YB STYLE

HOWARD RIDER,* VK3ZJY

To a modern reasonably equipped Radio Amateur with his commercially built s.s.b. transceiver, cubical quad, monitoring scope, etc., moving through Indonesia is like turning back the pages of history. With very, very few exceptions no such sophisticated equipment will be found, nor even the components out of which such gear can be built.

Valves such as 6V6s, 6L6s, EL34s and 807s form the vast majority of final r.f. amplifiers and modulators, whilst antennas are nearly all of the single wire feed types (inverted L, Windom, etc.). I have only seen two folded dipoles, both manufactured from t.v. ribbon. Co-axial cable is a term read in the very few available magazines.

The few home-brew s.s.b. units I have viewed are pieces of art and reflect the ingenuity of the builders. For example, the Australian Amateur can purchase a crystal filter or p.s.n. from any one of a number of sources. His Indonesian counterpart, however, not only does not have this facility, but could not afford it. The cost would represent more than one month's, and in some cases more than two months, wages (I am assuming the price to be around \$9.00).

Following my meetings in Djakarta (Region 0), my work took me to Bogor, a township some 70 kms. distant (Region 1). Here I was very fortunate as my counterpart at the University was Soedarsono, himself a Radio Amateur (YD1PY). Being a member of the local group, he swiftly arranged an informal meeting. Present were: Sofjan Wahab (YB1FX), President; Atje Dimjati (YD1PX), Secretary; Mardijanto (YC-IPD), M. Ali Nurswan (YD1GA), David Djoemeno (YD1GB), John Murdock (YB1AAK/WA9RLR), Soedarsono (YD1PY) and myself.

After a long general discussion it was decided to hold a public display of equipment and operation techniques on 17th August which is Indonesian Independence Day, perhaps the most important national holiday of the year.

There was to be a general exhibition in a very large hall in Bogor and permission would be sought for display area. If gained, the exhibition would be a milestone, one of the first of its kind ever held in Indonesia.

My presence was politely but firmly requested and even although at the time I would be working in Denpasar, Bali, over 1,000 miles away, it was agreed that I fly back and put in an appearance. Living in the area, John Murdock would naturally come and he offered whatever help he could give.

There was more to this display than appeared on the surface as I was later to find out—it was only the incentive to start that was needed.

For many reasons that are generally known, Amateur Radio in Indonesia is very young, actually just a little over

three years old. It is up to about the same stage that existed in Australia in the late 1930s. The old timers will remember those days as ones in which individuals, usually Amateurs, were transmitting regular programmes both on the broadcast and lower short wave bands.

That is the position that exists in Indonesia now. There are two main divisions (a) Radio Amateurs licensed by the government to operate on Amateur frequencies and within the framework of International Amateur Radio Regulations; they issue three classes of licence depending upon the examinable knowledge reached by the Amateur; and (b) Broadcast station licences issued by the government to operate within the broadcast and lower short wave bands; there are two licences depending upon the experience and qualities reached, but knowledge of radio is not a pre-requisite.

Unfortunately there are many unlicensed broadcast stations—policing the regulations is very difficult because of staffing and equipment problems. It is a slow process weeding out the unlicensed, but it is being undertaken and gathering momentum as finance and personnel become available.

I have seen a number of broadcast stations, most of which range between 60 and 100 watts input and have 807s in the final. Some are of good quality, others are very poor but all fill a need which is to give the local population some form of entertainment to listen to.

The general population, however, do not realise that there is a difference between the true Amateur and a broadcast station, to them they are one and the same. Many problems occur particularly because of the extremely limited radio knowledge of the broadcaster. Distortion and harmonic radiation in some areas create "birdies" and heterodynes all over the dial. Of course, the Amateur gets the blame.

Education of the public in this field was thus a further reason for the proposed display at Bogor. When this was first explained to me, I was a little incredulous, but now having travelled extensively throughout Indonesia, I fully agree with all that was said.

A further meeting was held three days later (Tuesday, 13th July) at which it was decided that the display would be completely Indonesian in gear—all home-built and transmissions would take place in the 3.5 MHz band. A letter was despatched to the Hall Committee requesting available space.

The following day I began my tour which took me over 1,000 miles to the east of Bogor. I was very surprised to find how effectively the grapevine operated.

Amateurs in Jogjakarta and Surabaya not only knew of the proposal but were watching the outcome with great interest. It became obvious to me that

if successful, many other such exhibitions would be held the following year in other regions. If unsuccessful, it would be a bitter blow to the Amateur fraternity.

As promised I flew back from Bali and arrived in Bogor during the afternoon of 16th August. Things had not gone well and little had been done because no reply had been received from the Hall Committee up to 1800 hours on 16th.

When I told of the general interest shown, the President (Sofjan), Soedarsono and I went to see the organiser and space allocation committee. Valid reasons were given for no allocation, but by this time Sofjan was adamant and determined.

Things began to move. By 8 p.m. we had space, 9 p.m. we had tables and other Amateurs came to help. 10 p.m. we had display posters beautifully drawn, mostly in caricature by Atjo (Secretary). 11 p.m. we had the antenna erected—a half wave dipole on 3.5 MHz. At midnight we had gathered some components and equipment for display. After laying out where everything would go the next day, all left the hall at 0100, all very tired but satisfied.

At 0700 on the 17th we again met at the hall and began organising power, display boards, literature to be printed and distributed to interested spectators, covering of tables, etc. By this time there were Amateurs everywhere, all doing their respective parts. I don't remember anyone having breakfast or lunch as it was a race against time—the exhibition was to be opened by the Governor at 1600 hours.

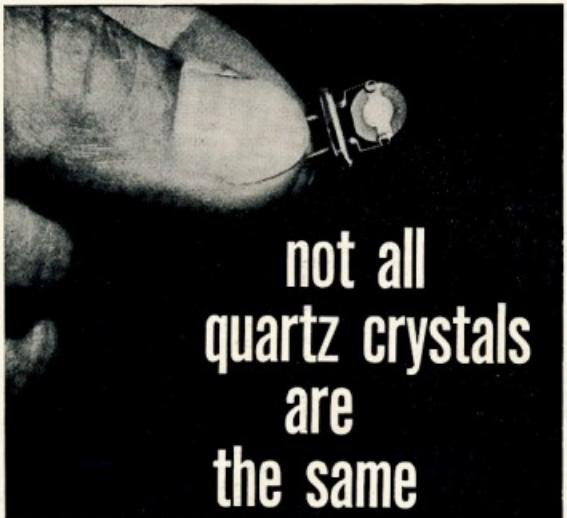
Somewhat it was done and the result? One of the most colourful and most visited displays at the exhibition. Even the Governor made special mention at the opening.

It will carry on until 24th August and a timetable was drawn up always to have someone in attendance to take and answer the many numerous enquiries from people in all walks of life. The name given to the stand "Expo Orari" (Organisation of Radio Amateurs of the Republic of Indonesia) was very apt.

For me personally the whole operation had a deeper meaning. I was an Australian working in a foreign country—but in this case I was not accepted as a foreigner. I was an Amateur regardless of race, creed or colour and no special compensations were given. My hands got just as dirty as theirs in trying to overcome the many problems that arose.

Late that night I said a temporary goodbye to all concerned because I was expected many miles away the following morning to begin my work. However, I shall always remember that day and a half at Bogor where I played a very small part and saw the true Amateur co-operative spirit at its very best.

* 223 Cumberland Road, Pascoe Vale, Vic., 3044



not all quartz crystals are the same

Today's sophisticated communications equipment calls for crystals that meet the most exacting standards of the art.

Standards that were acceptable a few years ago cannot meet the requirements of design engineers today. Today's tight tolerances demand quartz blanks with precision selected angles of cut, and Hy-Q use X-ray diffraction equipment to determine this most important factor.

Long term stability is assured by close engineering control of all processing in an air-conditioned environment. The blanks are then checked to determine the frequency change over the temperature range.

The crystal is then precision calibrated to frequency using a crystal impedance meter which simulates the manufacturer's oscillator specifications.

Hy-Q crystals are custom manufactured to meet all these exacting requirements.

It is for these reasons that Hy-Q crystals have been readily accepted as a standard by the Communications Industry and why we can guarantee them against defective material and workmanship or any deterioration in performance when they are used in equipment for which they were specifically made.

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WA: Associated Electronic
Services Pty. Ltd.,
Morley. Phone 76-3858.
NT: Combined Electronics Pty. Ltd.
Darwin. Phone 6681.

A TABLE OF DISTANCES BETWEEN AUSTRALASIAN V.H.F. LOCATIONS

DEREK BRUMLEY,* VK3AVW

It has long been felt that a table of distances between some of the most popular v.h.f. locations in Australasia would be very useful. Three applications come especially to mind:

- (1) The compilation of field day and contest logs, where scoring is dependent on the distance covered;
- (2) The planning of possible paths for attempts at distance records, and
- (3) Calculation of path loss for scatter circuits.

Small distances may be obtained fairly accurately by reading directly off a map, but above a few hundred miles it becomes necessary to calculate the great circle distance between the points of interest. This is a long and tedious process if done manually, but fortunately it is well within the capabilities of the modern digital computer.

A programme has been developed which calculates the angle subtended at the earth's centre by any two points on the earth's surface, given their latitudes and longitudes. This is then multiplied by the earth's radius to give the required great circle distance.

The programme makes allowance for the difference between the polar and equatorial radii of the earth by using the latitudes of each pair of locations to calculate an "average" radius for each path. Although this is only a first order correction, it is sufficient for the present application. The accuracy of distances in the table is limited by that of the latitudes and longitudes which were taken to the nearest minute of arc.

Those within Victoria were obtained from survey maps; the rest were found from the "Times World Index". The computer calculates the distances to several significant figures, but rounds them off to the nearest integer before printing.

No apologies are offered for the choice of locations. It was hard enough to restrict the number to sixty, but any increase would have made the table prohibitively large.

The table appears on pages 14 and 15.

* 32 Faversham Rd, Canterbury, Vic., 3126.

This month there are no local Technical Articles.

WHY?

We have the Articles,
but few Draughtsmen.

CAN YOU HELP US?

VK3 or Interstate aid welcome

John Moyle Memorial National Field Day Contest, 1972

SATURDAY, 12th FEBRUARY, TO SUNDAY, 13th FEBRUARY, 1972

The Federal Contest Committee of the Wireless Institute of Australia invites all Australian Amateurs and Short Wave Listeners to participate in this Annual Contest, which is held to perpetuate the memory of John Moyle, whose efforts advanced the Amateur Radio Service.

There are two divisions of this Contest, one of 24 hours continuous duration, and one of 6 hours continuous duration. The six-hour period has been included to encourage the operator who is unable to participate for the full 24-hour period. The 24-hour continuous operation is to be chosen by an operator from the 26-hour period.

An operator using 25 watts or less input to the final stage will be considered for a certificate where his activity warrants its issue.

DATE

From 0600 GMT, 12th February, 1972, to 0800 GMT, 13th February, 1972.

OBJECTS

The operators of Portable and Mobile Stations within all VK Call Areas will endeavour to contact other Portable/Mobile and Fixed Stations in VK Call Areas and Foreign Call Areas.

RULES

1. There are two divisions, one of six (6) hours, and one of twenty-four (24) hours duration. The six-hour period for operating may be chosen from any time during the Contest, but the six-hour period so chosen must be continuous. In each division, there are six sections:

- (a) Portable/Mobile Transmitting, Phone,
- (b) Portable/Mobile Transmitting, C.W.
- (c) Portable/Mobile Transmitting, Open,
- (d) Portable/Mobile Transmitting, Multiple Operation, open only.
- (e) Fixed Transmitting Stations working Portable/Mobile Stations, open only.
- (f) Reception of Portable/Mobile Stations.

2. All Australian Amateurs are encouraged to take part. Operators will be limited to their licensed power. For Portable entries, power shall be derived from a self-contained and fully portable source.

(a) Portable/Mobile Stations shall not be situated in any occupied dwelling or building. Portable/Mobile Stations may be moved from place to place during the Contest.

No apparatus shall be set up on the site earlier than 24 hours prior to the Contest.

All Amateur bands may be used, but no cross band operating is permitted. Cross mode operation is permitted.

Entrants in Section (d) for Multiple Operator Stations can set up separate transmitters to work on different bands

at the same time. All such units of a Multiple Operator Station must be located within an area that can be encompassed by a circle not greater than half a mile diameter.

For each transmitter of a Multiple Operator Station a separate log shall be kept with serial numbers starting from 001, and increasing by one for each successive contact. All logs of a Multiple Operator Station shall be submitted by the operator under whose Call Sign the transmitters are working. No two transmitters of a Multiple Operator Station are permitted to operate on the same band at any time.

3. Amateurs may enter for any section.

4. One contact per station for phone to phone, also one for c.w. to c.w. per band is permitted. Cross mode operation will be accepted for scoring.

5. Entrants must operate within the terms of their licences and in particular observe the regulations with regards to portable operation.

6. For VK stations contacting VK stations, the exchange of serial numbers consisting of RS or RST report plus three figures commencing with 001 and increasing by one for each successive contact by the VK station shall be proof of contact. The exchange of RS or RST reports only with non-VK stations shall be sufficient proof of contact for this contest.

7. Scoring—

(a) Portable/Mobile Stations:

For contacts with Portable/Mobile Stations outside entrant's Call Area 15 points

For contacts with Portable/Mobile Stations within entrant's Call Area 10 points

For contacts with Fixed Stations outside the entrant's Call Area 5 points

For contacts with Fixed Stations within the entrant's Call Area 2 points

(b) Fixed Stations:

For contacts with Portable/Mobile Stations outside entrant's Call Area 15 points

For contacts with Portable/Mobile Stations within entrant's Call Area 10 points

Operation via active repeaters or translators is not allowed for scoring purposes.

Example of Victorian S.W.I.'s Log

Date Time (GMT)	Band (mhz)	Call Sign Heard	RST No. Sent	Station Worked	Pts. Clim.
13/2/72 0600	80	VK2AAH/P	59001	VK3ATL/P	15
0610	80	VK3ATL/P	59008	VKSOV	10
0620	40	VK2AAH/P	59009	VK6VE/P	15
0640	20	VK3OV	59010	VK3OX/P	*
0755	20	VK4OF/P	59040	VK4DX/P	15

* No claim Fixed Station.

8. The following shall constitute Call Areas: VK1, VK2, VK3, VK4, VK5, VK6, VK7, VK8, VK9 and VK0.

9. All logs shall be set out under the following headings: Date/Time (G.M.T.), Band, Emission, Call Sign, RST/No. Sent, RST/No. Received, Points Claimed. Contacts must be listed in numerical order.

In addition, there shall be a front sheet showing the following information:—

Name Address
Call Sign Section
Division (6-hour or 24-hour)
Points Claimed

Call Sign of other op/s (if any)
Location of Portable/Mobile Station
From hours to hours

A brief description of equipment used, and points claimed, followed by the declaration:

"I hereby certify that I have operated in accordance with the rules and spirit of the Contest."
Signed Date

10. The right is reserved to disqualify any entrant who, during the Contest, has not observed the Regulations and the Rules of this Contest, or who has consistently departed from the accepted code of operating ethics.

11. The decision of the Federal Contest Manager of the Wireless Institute of Australia is final and no disputes will be entertained.

12. Certificates will be awarded to the highest scorer of each section of each 6 or 24-hour division. Additional certificates may be issued at the discretion of the F.C.C. The 6-hour certificates cannot be won by a 24-hour entrant.

13. **Return of Logs:** All entries must be postmarked not later than 6th March, 1972, and be clearly marked "John Moyle Memorial National Field Day Contest, 1972", and addressed to:

Federal Contest Manager, W.I.A.,
Box 638, G.P.O.,
Brisbane, Qld., 4001.

Written comments are invited from all contestants.

RECEIVING SECTION

14. This section is open to all Short Wave Listeners in VK Call Areas. The Rules shall be the same as for the Transmitting Stations, but may omit the serial numbers received.

Logs must show the Call Sign of the Portable/Mobile Station heard, the serial number sent by it, and the Call Sign of the Station being worked.

Scoring will be on the same basis as for Transmitting Stations. It will not be sufficient to log a station calling CQ. A portable/mobile station may be logged once only for phone and once only for c.w. in each band.

Awards: A certificate will be awarded to the highest scorer of each of the 6-hour and the 24-hour divisions.

DISTANCES BETWEEN AUSTRALASIAN V.H.F. LOCATIONS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				
1	—	26	136	361	131	235	511	223	137	326	150	308	116	333	293	297	330	359	404	399	253	368	286	446	247	174	762	559	740	100				
2	—	26	111	385	151	214	535	249	155	351	176	331	142	307	265	304	263	387	573	228	342	259	421	222	149	781	622	770	1050					
3	136	111	—	472	237	115	626	353	23	449	284	415	251	198	154	173	212	261	291	265	152	240	159	311	148	39	839	705	843	1060				
4	361	385	472	—	296	521	154	165	24	76	236	59	273	661	605	645	672	633	611	726	612	710	631	757	606	568	434	239	307	81				
5	131	151	237	236	—	301	389	132	26	215	97	180	100	430	378	409	428	398	420	497	376	476	396	534	370	274	632	472	619	959				
6	235	214	115	521	301	—	674	429	285	514	370	462	343	153	92	179	183	157	185	212	202	216	161	237	203	94	842	741	862	1010				
7	511	535	626	154	389	674	—	296	306	192	173	213	214	815	759	726	787	785	881	763	864	791	717	957	881	662	353	105	729	1050				
8	223	249	353	165	132	429	299	—	153	107	77	133	116	551	501	520	522	512	512	611	476	476	590	569	649	461	391	598	395	500	959			
9	137	155	230	242	26	205	306	153	—	229	122	185	194	420	365	403	430	391	405	486	374	468	389	520	369	266	625	476	618	919				
10	326	351	449	78	215	514	192	107	229	—	184	90	223	645	592	620	650	610	626	711	579	689	607	748	573	487	506	290	459	969				
11	150	196	284	236	97	370	375	77	122	184	—	194	39	482	435	447	481	440	517	548	400	518	436	582	393	322	663	471	532	1000				
12	308	331	415	59	180	462	213	133	185	90	194	—	226	656	547	514	614	573	534	668	556	553	574	696	550	450	469	292	443	927				
13	116	142	251	273	100	343	414	116	124	223	39	228	—	449	404	411	446	405	493	515	363	483	406	562	396	299	676	568	609	1020				
14	334	307	196	436	153	315	550	435	460	449	482	603	449	—	60	89	64	232	67	146	68	116	153	160	955	888	1013	1150	1150					
15	290	265	154	605	378	92	759	501	365	592	435	547	404	60	—	105	96	82	214	122	154	125	90	158	158	116	935	830	964	1102	1102			
16	297	270	173	645	409	179	799	520	403	620	447	588	411	80	105	—	42	23	319	124	70	74	18	188	77	100	1055	878	1013	1190				
17	330	304	261	672	438	183	626	502	430	480	481	614	446	49	96	42	—	41	300	83	111	38	46	147	119	164	1021	903	1043	1128				
18	290	263	161	638	388	157	787	512	391	610	440	575	405	64	82	23	41	—	296	118	83	79	9	179	89	125	967	864	968	1101				
19	464	387	299	611	430	185	755	561	500	465	517	555	498	252	214	319	300	296	—	272	366	315	304	247	369	279	847	802	933	933				
20	399	373	265	728	497	212	881	617	485	711	548	668	515	67	122	124	83	118	272	—	194	64	125	66	261	226	1053	932	1074	1197				
21	553	226	152	612	376	202	763	476	374	579	400	566	363	145	154	70	111	83	366	194	—	139	74	258	8	129	980	985	1191	1191				
22	368	342	240	710	476	216	864	590	461	689	512	583	483	62	125	74	38	79	315	64	139	—	83	130	147	202	193	941	1071	1228				
23	286	259	159	631	396	175	781	504	389	607	349	374	470	40	73	90	18	46	9	304	125	74	83	187	80	124	988	963	998	1101				
24	446	421	311	757	534	237	911	650	520	748	593	699	562	111	188	147	179	247	66	258	130	187	—	265	272	1062	977	1070	1120					
25	347	223	144	607	370	203	707	569	469	371	593	399	550	356	151	158	77	119	88	369	291	8	147	80	265	—	127	986	842	985	1101			
26	174	149	309	568	274	94	682	391	266	487	322	450	390	160	116	139	164	125	279	226	129	202	124	272	127	—	568	746	870	1062				
27	162	781	839	454	632	842	353	598	626	506	663	469	977	995	935	1005	1601	1621	987	847	1053	990	1057	988	1062	965	868	—	257	121	147			
28	599	622	705	238	472	741	105	395	475	290	471	292	506	888	830	878	903	864	892	983	848	941	863	977	842	740	237	—	175	715	1000	1000		
29	749	706	843	397	619	862	286	560	618	459	632	443	660	1013	954	1013	1606	1053	986	982	1074	991	1071	996	981	874	874	121	175	—	175	715	1000	1000
30	1045	1056	1068	817	934	1014	1019	794	916	915	986	1001	867	1207	1036	1182	1198	1176	933	1117	1211	1226	1181	1120	1192	1024	715	590	—	590	—	—	—	
31	570	593	675	210	442	711	89	369	445	266	444	462	481	507	798	744	731	721	818	910	830	913	846	813	813	709	264	314	314	195	712	1000		
32	978	994	1041	666	850	1027	588	823	840	740	830	897	922	1176	1118	1196	1209	1179	969	1231	1192	1243	1181	1221	1189	1065	236	488	1025	1025	1025			
33	641	664	744	281	513	777	151	440	513	333	553	524	864	866	916	917	941	943	928	898	888	979	920	812	883	778	220	46	136	950	950	950		
34	830	846	905	501	700	907	413	665	693	572	731	537	765	1059	999	1070	1606	1053	966	1115	1057	1121	1054	1153	1053	934	88	313	515	444	444			
35	558	580	657	205	429	626	116	339	429	270	440	251	474	834	776	829	833	852	854	814	737	893	803	889	819	797	699	240	70	192	675	675		
36	1123	1133	1167	840	999	1135	779	966	976	917	1052	863	1081	1224	1224	1312	1312	1381	1381	1075	1328	1316	1316	1313	1313	1313	187	647	647	647	647	647		
37	396	576	475	818	636	322	960	768	615	834	720	763	598	345	343	434	389	407	208	321	457	384	314	260	495	445	202	1022	1020	1079	1033			
38	472	448	341	742	535	238	882	665	505	745	668	684	581	188	195	269	233	252	167	167	347	345	375	343	403	403	403	965	955	955	955			
39	914	896	804	1060	927	888	1188	1054	903	1103	1020	1017	1014	688	683	767	730	750	510	662	832	729	759	888	838	778	1154	1205	1205	1219	1219			
40	513	485	377	810	593	292	962	720	576	806	657	727	621	192	223	262	231	232	256	139	332	201	261	74	330	345	1094	1094	1130	1130				
41	496	471	360	802	580	281	944	742	565	755	571	742	533	265	309	306	217	229	517	262	195	205	223	321	260	325	106	103	103	103	103			
42	556	533	438	747	609	302	931	733	570	800	623	741	598	286	321	217	231	241	531	279	202	221	234	326	203	321	111	103	103	103				
43	652	655	516	473	666	553	1031	732	671	839	636	639	617	411	453	349	363	372	667	467	326	351	366	463	328	455	196	112	112	112	112			
44	483	465	373	685	510	256	826	641	688	703	597	630	578	282	268	367	341	346	80	266	422	349	354	253	427	349	898	869	950	946				
45	288	268	566	613	829	354	955	761	668	828	713	757	691	336	334	415	380	398	202	312	480	375	407	436	436	436	436	1020	976	1076	1033	1033		
46	1760	1737	1630	1979	1895	1525	2110	1949	1867	2082	1891	1928	1961	1922	1885	1900	1970	1967	1871	1929	2032	1962	1975	1881	2034	1922	1573							

Area	KEY	Place	Lat. °S	Long. °E	Area	KEY	Place	Lat. °S	Long. °E	Area	KEY	Place	Lat. °S	Long. °E
VK1	1	Canberra	35.300	149.123	VK2	11	Sydney	33.917	151.877	VK3	21	Perth	31.233	115.891
	2	Mt. Ginninderra	35.534	149.767		12	Tamworth	31.117	151.950		22	Mt. Cowley	31.000	143.637
VK2	3	Albury	36.083	146.917	VK3	13	Wollongong	34.417	150.867		23	Mt. Waverley	37.880	145.118
	4	Armidale	30.533	151.567		14	Balmain	37.567	143.850		24	Tahara	37.750	141.700
VK3	5	Strathalbyn	35.350	145.550	VK4	15	Bendigo	36.887	144.867	VK5	25	Traralgon	38.300	146.533
	6	Deniliquin	35.350	144.967		16	Frankston	36.133	145.117		26	Warragatta	38.100	146.533
VK4	7	Lismore	28.800	153.283	VK5	17	Geelong	38.150	144.550	VK6	27	Biloela	24.350	150.500
	8	Newcastle	32.917	151.767		18	Melbourne	37.817	144.967		28	Brisbane	27.300	153.600
VK5	9	Orange	32.917	151.767	VK6	19	Mildura	34.200	142.150	VK7	29	Bundaberg	24.833	152.350
	10	Adelaide	34.847	145.417		20	Port Lincoln	35.000	145.000		30	Rockhampton	24.500	150.000
VK6	11	Adelaide	34.847	145.417	VK7	21	Port Lincoln	35.000	145.000		31	Winton	25.500	145.000
	12	Woomera	34.847	145.417		22	Winton	25.500	145.000		32	Winton	25.500	145.000

DISTANCES BETWEEN AUSTRALASIAN V.H.F. LOCATIONS

	SL	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60			
	Lat. °S.	Long. °E.														Lat. °S.	Long. °E.																
1	570	978	641	830	558	1122	596	472	914	513	466	556	652	483	588	1760	2224	2053	1582	1924	434	434	535	497	1217	1889	1434	1373	1331	1447			
2	593	994	664	848	580	1135	576	446	896	488	471	535	635	465	268	1737	2306	2043	1561	1922	412	411	516	417	1211	1988	1450	1384	1339	1450			
3	675	1041	744	906	567	167	475	341	804	377	360	434	574	373	466	1630	2112	1942	1459	1716	348	352	472	369	1188	1925	1545	1485	1429	1500			
4	210	665	281	501	205	840	818	742	1065	810	802	787	822	868	813	1797	2344	2221	1783	2113	795	794	888	794	1182	1833	1387	1461	1467	1467			
5	445	840	515	883	429	999	636	533	927	593	580	605	600	510	629	1636	2233	2088	1618	1959	563	563	667	567	1167	1881	1440	1425	1423	1504			
6	711	1027	777	907	686	1123	362	238	689	292	281	323	429	258	354	1525	1997	1830	1347	1688	384	394	524	422	1055	1833	1660	1569	1508	1555			
7	39	589	161	413	119	779	960	892	1189	966	964	921	954	895	955	310	3445	3234	1805	2235	944	941	1001	939	1233	1843	1366	1480	1507	1385			
8	369	623	449	685	369	996	685	665	1054	720	707	732	797	641	781	1940	2356	2214	1742	2090	648	645	732	641	1290	1946	1331	1347	1337	1399			
9	445	840	515	883	429	996	615	517	903	577	566	579	645	488	698	1877	2308	2052	1590	1937	564	565	671	571	1141	1856	1466	1450	1423	1504			
10	256	740	331	572	270	917	834	745	1100	806	795	950	840	703	628	2003	2390	2239	1795	2144	755	753	839	746	1255	1910	1381	1384	1389	1413			
11	444	840	515	731	440	1052	720	680	1020	657	642	682	750	597	713	1891	2317	2177	1761	2047	571	568	656	564	1303	1833	1644	1333	1312	1385			
12	260	697	333	537	251	863	763	684	1017	752	743	731	700	630	757	1928	2302	2174	1713	2063	742	741	834	744	1166	1828	1429	1464	1461	1504			
13	481	922	533	765	477	1081	681	581	1064	627	611	660	743	578	691	1867	2213	2160	1862	2326	533	529	617	558	1364	1881	1332	1326	1301	1385			
14	587	1178	924	1059	834	1283	345	189	688	191	169	204	447	292	326	154	1974	1789	1301	1261	1525	230	231	314	1317	1222	1896	1661	1682	1664			
15	799	1118	856	999	776	1224	343	195	683	223	207	301	433	268	324	1469	1981	1803	1317	1632	309	321	453	356	1096	1885	1681	1563	1491	1660			
16	848	1198	917	1070	829	1218	424	268	767	569	237	383	555	367	415	1523	2025	1853	1376	1795	206	217	349	251	1199	1980	1623	1482	1403	1586			
17	872	1209	941	1086	852	1218	388	233	732	221	196	249	494	310	380	1481	2013	1824	1344	1775	217	231	363	270	1275	1970	1654	1520	1458	1585			
18	834	1179	905	1063	814	1291	407	252	750	523	229	365	505	346	398	1515	2038	1853	1364	1665	229	241	372	274	1176	1967	1633	1492	1421	1593			
19	777	968	229	905	737	1075	208	164	510	256	254	175	484	80	202	1279	1820	1620	1164	1530	151	531	553	663	568	882	1761	1373	1369	1388			
20	921	1231	968	1116	897	1236	321	167	662	139	113	283	435	296	312	1299	1934	1743	1254	1862	262	279	407	323	1128	1929	1746	1597	1511	1795			
21	818	1192	883	1067	803	1310	486	335	832	332	307	447	585	422	480	1929	2120	1944	1346	1775	206	202	326	224	1247	2022	1533	1418	1349	1518			
22	910	1243	979	1121	869	1349	384	228	725	201	174	245	495	347	375	1455	1996	1804	1315	1641	205	221	351	263	1183	1962	1688	1534	1469	1594			
23	833	1181	902	1054	814	1285	416	261	759	261	237	375	515	354	407	1323	2047	1863	1370	1704	223	234	366	267	1185	1975	1625	1489	1419	1591			
24	946	1231	1011	1124	919	1318	320	122	568	204	174	228	373	253	232	1336	1967	1718	1517	1731	211	231	349	381	1077	1881	1661	1466	1371	1551			
25	813	1189	883	1053	797	1313	485	341	838	339	314	453	591	427	486	1600	2127	1941	1453	1783	209	205	326	225	1251	2054	1546	1410	1344	1511			
26	709	1065	778	934	690	1187	445	306	736	349	322	463	520	394	436	1594	2084	1911	1422	1764	325	331	455	352	1148	1923	1375	1475	1413	1564			
27	266	238	220	248	140	427	1622	1007	1154	1094	1095	1055	971	890	1020	2081	2305	2234	1822	2179	1185	1196	1296	1191	1051	1536	1679	1827	1589	1555			
28	31	438	46	313	79	684	1601	946	1205	1084	1018	975	981	867	997	1323	2343	2338	1898	2248	1635	1707	1475	1211	1773	1434	1371	1603	1569				
29	193	325	135	153	192	327	1079	1046	1239	1120	1128	1046	1034	950	976	1269	2415	2337	1920	2296	1181	1182	1283	1188	1167	1654	1766	1730	1720				
30	713	324	681	444	675	204	1633	1084	1013	1182	1194	1035	954	930	951	2065	2365	2266	1826	2176	992	991	1061	966	1155	1727	1481	1369	1323	1605			
31	-	74	324	47	691	971	1177	907	987	945	947	888	938	878	967	2165	2412	2312	1784	2222	1004	1003	1004	1004	1004	1004	1004	1004	1004	1004			
32	-	499	-	447	176	748	204	1448	166	1217	1253	1250	1198	1076	1036	1148	2211	2263	2222	1850	2184	1589	1592	1507	1406	963	1362	1884	2055	2081	2094		
33	-	71	447	-	272	648	1626	978	1218	1056	1051	1002	1002	894	1020	1218	2149	2435	2343	1910	2289	1675	1674	1679	1575	1211	1747	1463	1609	1644	1603		
34	-	324	176	-	304	275	1076	1185	1194	1156	1156	1093	1093	919	953	1073	2116	2316	2255	1856	2166	1525	1525	1584	1604	1507	1606	1875	1916	1816	1816		
35	-	47	476	-	304	364	1076	1035	1035	997	997	929	929	876	101	129	130	130	130	130	129	129	129	129	129	129	129	129	129	129	129		
36	-	691	204	357	663	-	1196	1236	1208	1320	1320	1158	1198	1198	1198	2074	2140	2122	1794	2114	1511	1518	1518	1538	1538	1888	1168	2084	2234	2217	2271		
37	-	911	1146	1026	1075	935	1169	154	178	1310	1795	1823	1681	1572	1468	741	-	217	207	508	2159	2179	2273	2226	1276	1667	1978	1965	1961	1961			
38	-	1094	1397	1074	1352	991	1094	1074	1074	1074	1074	1074	1074	1074	1074	1074	2156	2179	2179	1796	2176	29	-	134	134	134	134	134	134	134	134	134	
39	-	1095	1507	1169	1364	1090	1629	722	572	1053	510	496	496	490	490	704	710	714	1625	2373	1925	1925	1925	1925	1925	1925	1925	1925	1925	1925			
40	-	1202	1611	1357	1055	1026	888	626	565	562	1036	1061	857	703	635	835	1235	1270	1245	945	1241	1388	1404	1344	1445	-	809	2586	2550	2547	2547		
41	-	1688	1362	1747	1505	1727	1168	1636	1770	1378	1843	1888	1665	1511	1633	1643	1756	1406	1540	1487	1654	2166	2201	2332	2239	859	-	3207	2992	3200	3231	3231	
42	-	1439	1884	1463	1719	1481	2084	2017	1877	2347	1865	1860	1978	2085	1915	2011	3141	3057	3484	2997	3328	1571	1553	1508	1509	2085	3207	-	476	505	307	307	307
43	-	1568	2055	1699	1809	1569	2524	1903	1556	1247	1755	1707	1805	1894	1834																		

1971 REMEMBRANCE DAY CONTEST RESULTS

QUEENSLAND WINS R.D.

Yes, VK4, with VK9's help, has won the R.D. Contest for 1971 by a substantial margin in a very friendly contest. Congratulations to the winners and thanks to all who participated. I hope everyone enjoyed themselves.

With few exceptions, all the high scoring logs were credits to the compilers. My real admiration and thanks for jobs well done. (Who had the typist on R.D. logs?) I would like you to see how well some of these logs were set out. There were duplications, but invariably there were a few points counted low to make up.

To ensure that VK4 does not capture the trophy during 1972, and for other reasons, I would appreciate you analysing the results and considering them carefully.

Tight contests make my task much more difficult, but I don't mind as long as we go ahead. Let your Federal Councillor have your ideas on a better contest—he is interested.

I have some thoughts on contest closing dates and may apply them next year.

A few contestants should look closely at contest rule 6 and P.M.G. regulations (82).

Congratulations to the listeners who submitted some fine logs.

Thanks to those ops. who put in a little note telling how they enjoyed the contest and offering suggestions of improvement.

I noted a full c.w. listeners' log from Eric Trebilcock. Trevor VK2NS put in

DETAILS OF DIVISIONAL SCORES

Division	Logs	Licenses	% Participation	Average Top Six Logs	State Points	State Score
VK2+1+9	141	2,162	6.5	984	31,165	3,014
VK3	75	1,971	3.8	817	21,689	1,642
VK4+9	124	809	14.9	1,150	30,944	5,886
VK5+8	86	802	10.7	1,245	28,950	4,341
VK6+9	60	512	11.5	1,288	16,876	3,268
VK7+0	61	243	25	730	10,603	3,389

You will note that compared to last year, ref. "A.R." Nov. 1970, we are not holding our own. This is not good because the Institute is moving forward quite steadily and successfully. Why have we not advanced with the R.D. Contest? Looking further, note the high participation level of VK7 + VK0. Even by adding a high average top six logs VK7 + VK0 would not have won this year. They needed more State points.

his log as a token to his late friend Ray who went "Silent Key" just before the contest started. We hope that there will be more on c.w. next year, Trevor Murray VK4KX was also disappointed there were not more c.w. ops. Others hoped for a better ZL participation next year. As our contest details to ZL were a little late this year, I am sure that there will be more ZLs next year.

Thanks for reading so far. I won't hold you up any longer as I suppose you want to get ready for the Ross Hull and John Moyle contests.

Peter VK4PJ, Federal Contest Manager.

VK5 + VK8 and VK6 + VK9 would doubtless be around the top with a higher participation level as their average points per log is above VK4.

VK2 put up a good show, but together with VK3, seems to have the problem of participation. Why can't these States have a higher level?

There are some interesting solutions to your problem.

Most States seem to have their own form of log which goes out with their bulletin. This helps, but, as VK4 has found, is not sufficient. There must be a drive to get operators in the contest. VK4's success of the last two years has been assisted by the activities of Northern W.I.A. members.

I hope that after considering these results, you do something about making your State a winner next year.

NEW SOUTH WALES

Phone	Points	Phone	Points	Phone	Points
VK2BEC	968	VK2NF	188	VK2SW	63
2DO	963	2AGZ	186	2ZX	63
2BNS	941	2BAZ	170	2SG	57
2DME	935	2AF	167	2TS	57
2XT	851	2BZ	159	2ADD	54
2AJY	778	2APP	159	2VS	54
2BGF	777	2ABC	156	2ADL	48
2VQ	383	2DQ	151	2AXI	45
2ATT	378	2PN	149	2JW	43
2AGF	366	2BDB	149	2AAB	43
2JP	308	2AXJ	146	2CU	40
2BH	491	2AFA	141	2CW	40
2DX	482	2RFO	132	2ACZ	40
2AJX	478	2AKR	132	2AW	39
2AAC	460	2AJL	119	2ZP	39
2CS	456	2BKG	117	2EAC	37
2BMM/P	447	2YN	113	2IK	36
2HD	370	2LI	112	2AQ	33
2AWN	339	2ASJ	112	2EF	33
2AIM	395	2AOX	102	2AVT	28
2BDN	371	2BMD	102	2AKX	28
2OH	370	2CK	101	2WXP/P	21
2KNC	369	2DU	97	2ZWG	21
2AUQ	323	2DRU	97	2LA	17
2AJA	319	2AKY	90	2BJO/P	16
2QC	300	2BRM	86	2EY	14
2ADA	275	2AMA	86	2FT	13
2ZD	275	2BZ	74	2H	13
2AKQ	211	2DUT	70	2IX	8
2PF	205	2BKM	66	2ZTM	8
2AHP	204	2CF	73	2ZTP	7
2APQ	203	2GN	63	2ZUT	6
2UJ	194	2PQ	58	2ZWC	6

Open

Phone	Points	Phone	Points	Phone	Points
VK2BO	1,129	VK2AJQ	265	VK2RJ	47
2DO	361	2AV	140	2AU	41
2BLK	321	2AHM	82	2PP	12
2PU	298	2HZ	74		

C.W.

Phone	Points	Phone	Points	Phone	Points
VK2NS	594	VK2BZ	136	VK2AXX	56
2GR	401	2AN	134	2BHD	51
2BF	391	2AMB	82	2IV	45
2VN	249	2ZC	77	2XJ	40
2GT	184	2BRR	74	2XK	37
2QL	151	2JY	62	2AWI/P	38
2HW	143	2PQ	58		

Receiving

M. J. Rodden	...	...	...	856 Points
J. H. Hillard	L2074	...	...	639 ..
G. Rossman	...	...	...	625 ..
P. J. Vernon	L2081	...	...	546 ..
B. L. Bellomy	South Radio Club	...	...	533 ..
C. Ferguson	L2046	...	...	533 ..
D. W. Shepherd	...	...	...	139 ..
N. W. Newport	...	...	...	70 ..

VICTORIA

Phone	Points	Phone	Points	Phone	Points
VK3VK	1,023	419	419	VK3PR	150
3DF	972	3AU	341	3AM	131
3SM	896	1ASO	396	3AIS	106
3AXV	686	3BER	324	3AOW	99
3WV	680	3ZC	324	3ACA	98
3AMO	664	3BPN	254	3AJP	67
3APS	586	3AJX	253	3BRB	62
3CIF	583	3AJK	246	3DY	61
3JL	579	3AXM	237	3BCB	51
3AYL	570	3ZP	237	3HJM	50
3AKF	541	3CDK	212	3WM	48
3ZL	521	3RN	210	3BCZ	43
3PQ	511	3HE	198	3AHL	43
3MT	506	3JRC	174	3KRA	19
3BMT	496	3KR	174	3ABP	18
3BJB	464	3AXQ	160	3ZPN	11
3AIH	424			3ANM	6

Open

Phone	Points	Phone	Points	Phone	Points
VK3BCF	566	VK3YQ	363	VK3EZ	89
3QV	499	3DG	210	3ARV	88
3BDE	437	3AOI	211	3BDL	85

C.W.

Phone	Points	Phone	Points	Phone	Points
VK3XB	455	VK3XY	218	VK3TX	102
3KX	418	3RJ	145	3APN	102
3ZO	236			3ZM	55

144 MHz. Dual Conversion AM Receiver Kit

SPECIFICATIONS:

Frequency coverage: 144 - 145 MHz.

Sensitivity: 0.3 uV. for 6 dB. S + N/N.

1st I.F.: 14.4 MHz.; 2nd I.F.: 455 KHz.

Bandpass Filter at 455 KHz.

Input Impedance: 50 - 75 Ohms.

Audio output: 1 watt r.m.s. into 8 ohms.

Audio output impedance: 8 or 15 ohms.

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Varicap tuned VFO.

Kit includes all Capacitors, Resistors, I.F.'s, Pots, Switches and 14 Transistors.

Front end uses TIS88s; I.F., Dual Gate Mosfets.

Complete with Instructions and pre-drilled and etched Circuit Board

Special Introductory Price \$42.00

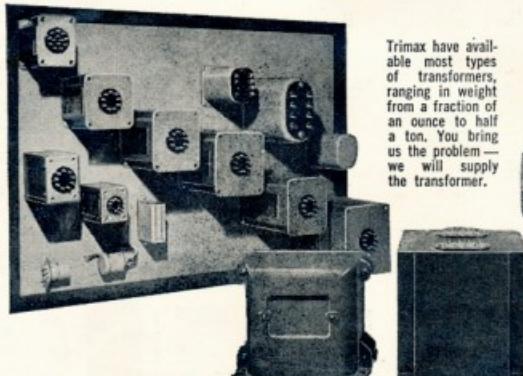
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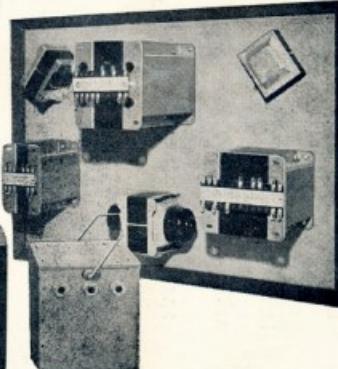
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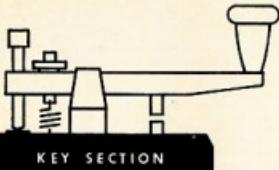


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LM 51



The Wireless Institute of Australia is pleased to invite Australian Amateurs to become members of the Key Section. The aims of the Key Section and qualifications for membership are as follows:

1. The Key Section of the W.I.A. is an association of Australian Amateurs interested in the use of Morse for communication.

2. Membership is open to any Amateur who holds a VK call sign; other interested persons may be admitted as associates.

3. Amateurs may become members by applying to the Key Section; applicants may be asked to provide proof that they satisfy the conditions for membership.

4. For the purpose of assessing membership of the Key Section the following conditions define a contact with another Amateur station:

(1) The communication must be by A1 or A2 mode by both stations.

(2) The contact must last at least 15 min.

- (3) The speed of sending is not a condition of these rules.
- (4) Contacts made during contests are not admissible.
- (5) Contacts made before 1st January, 1971, are not admissible.
- (6) Any VK call sign may be used only once in amateur contests.
5. Membership is open to Amateurs who communicate at least 50 points by the rules of paragraph 6, at least 25 of which must arise from contacts with other VK stations.

6. Points are obtained as follows:

- (1) A contact as defined in paragraph 4 counts one point.
- (2) If one station in the contact is operating 52 MHz or above, the contact counts two points; if both stations are operating 52 MHz, or above the contact counts four points.

7. All applications for membership of the Key Section should be sent to the President, Key Section, W.I.A., P.O. Box 57, East Melbourne, Vic., 3002. The consideration of applications for membership will be undertaken by Divisional Co-ordinators, who are appointed by Divisional Councils, or their nominated deputies. In the event of分歧, the ruling of the Federal Manager will be final.

8. A certificate of membership will be issued.

New members of the Key Section will be listed from time to time in "A.R.". It is planned to offer associate membership to overseas Amateurs, and perhaps also to S.W.L.'s. These schemes, and others, will be made known when our numbers have grown. I look forward to hearing from you! 73, Deane VK3DTX.

STOLEN

From the house garage of VK3BDD, D. Vlassopoulos, 2 Sandgate Ave., Glen Waverley, Vic., 3150 (phone 232-3469) about July were the following:

I issue IC700T Tx, IC700R Rx, IC700P p.s.u., home-brew linear 1kW in., digital freq. meter, home-brew nearly complete, Lafayette v.o.m. and t.v. rejuvenator, Philips r.f. f.m. generator, home-brew audio generator.

This matter is under police investigation. If anybody is offered any item from the above list or has any useful knowledge concerning them, please contact the police or the operator concerned.

★

SONNENSCHEIN BATTERY RANGE

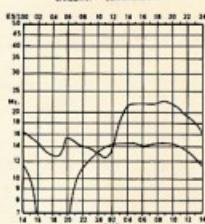
A new series dryfit battery has been developed by Sonnenschein to meet the need for float service in stationary operation. The new series can be distinguished by the marking dryfit ST, while the constant charge/discharge type is marked dryfit PC.

Further information from the Australian agents, R. H. Cunningham Pty. Ltd., 698 Collins St., Melbourne, Vic., 3000.

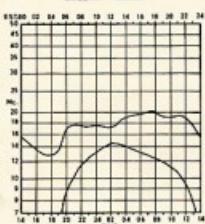
PREDICTION CHARTS FOR NOVEMBER 1971

(Prediction Charts by courtesy of Ionospheric Prediction Service)

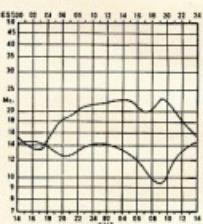
CANBERRA - JOHANNESBURG



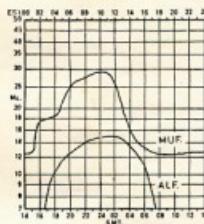
CANBERRA - MANSON



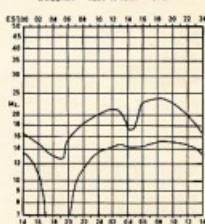
CANBERRA - RIO DE JANEIRO



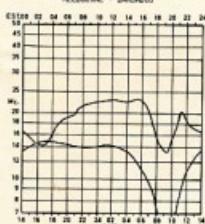
CANBERRA - VICTORIA



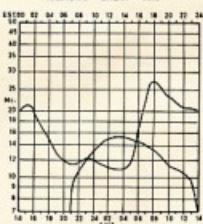
CANBERRA - WEST AFRICA S.E.



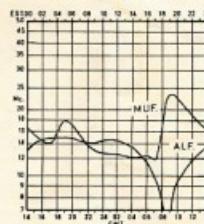
MELBOURNE - BARBADOS



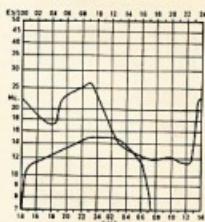
MELBOURNE - LONDON S.E.



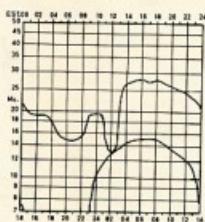
MELBOURNE - LONDON L.R.



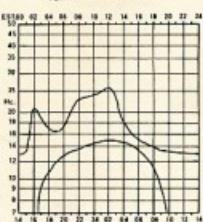
MONTREAL - HAMILTON S.R.



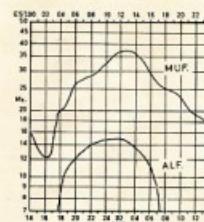
PERTH - CAIRO



PERTH - SAN FRANCISCO



TOOWOOMBA - HAWAII



VHF

Sub-Editor: ERIC JAMIESON, VK5LP
Forreston, South Australia, 5233.
Closing date for copy 30th of month.
All Times in E.S.T.

AMATEUR BAND BEACONS

VK9	52.320	VK6MX, Mawson.
	53.032	VK6TM, Macquarie Island.
	53.544	VK6PH, Casey.
VK2	52.230	VK2IL, Crows Nest, Sydney.
VK3	144.700	VK3VH, Vermont.
VK4	144.740	VK4VYV, 10 miles w. of Brisbane.
VK5	53.800	VK5VF, Mt. Lofty.
	144.800	VK5VF, Mt. Lofty.
VK6	52.600	VK6VF, Bickley, Perth.
	52.600	VK6VZ, Dunsborough.
	51.500	VK6VE, Mt. Barker.
VK7	144.900	VK7VHF, Devonport.
VK9	144.600	VK9XI, Christmas Island.
ZL1	145.100	ZL1Z, Zeehan, Tasmania.
	145.200	ZL1VHF, Wellington.
ZL3	145.200	ZL3VHF, Christchurch.
JA	51.997	JAIJIG, Japan.
ZK	50.100	ZK1IA, Cook Island.
KF6	50.100	KF6V, Hawaii.
W	50.091	WBKEAP, U.S.A.
HL	50.100	HL6SWI, South Korea.

From the newsletter of the Geelong Amateur Radio and T.V. Club comes advice that Keith VK6MX is running a slow c.w. beacon with 20 seconds of carrier each minute on 52.320 MHz. It will be in operation during the government high power beacon is installed in VK9 in March 1972. Providing this and the other two beacons listed are able to remain fully operational throughout the coming DX season, we may well see we will see 6 metre contacts between Australia and the Antarctic regions for the first time.

Mike VK2II has written advising that a temporary attended beacon will be running from his QTH in Sydney for the coming DX season. The beacon will be operating on 20 watts of s.w.r. into a turnstile antenna using his own call sign VK2II. Frequency 52.3 MHz, with the following sequence: 30 seconds carrier, pause, ident, at 7 w.p.m. (VK2II), then ten seconds silence, then another second carrier and so on. The proposed turn-on date is 1st Nov., so the beacon is therefore added to the current list above. The beacon will be running during the evenings 1700 to 2200 local time, and will wait until it is heard that the beacon will fill the gap until there is something operating from Dural, probably next year. Thanks for the advice Mike, this is a start in the right direction for VK2II and I know there will be many others waiting with interest the final beacon set-up at Dural, with particular thoughts for the 2 metre beacon planned.

Talking with Bob VK6BEE who lives near Albany, on 80 (!!) metres recently, I was pleased to learn there is every indication of increased activity from the Albany area this DX season. Bob has a 100-watt 10-metre rig and is installing a 4/4 on 2 metres at 57 ft. and 4 et. on 6 at 47 ft. Others getting in on the v.h.f. act from there include VK6ZCD, 6XY, 6RD, 6ZCW and 6JK. Bob VK6BEE also plans to go to 40 MHz, and if this comes into play will create a lot of interest eastwards. Bob also mentioned the likelihood of a 6 mx beacon from Albany soon on 52.955 with the call sign of VK6IVE. I will try and have this confirmed for inclusion in next month's listing.

Items of interest seem to get to me by long roundabout methods at times, so from the pages of "The Victorian VHFer" comes news that Wally VK6KVG in Nornalup and Rollo VK6GBO, in Perth, have been conducting 2 mx propagation experiments with Rollo becoming Perth's Northern heading on 144.229 MHz. Skeds are conducted daily at 0645 WEST (0645 EAST) using 80 ms as a liaison frequency. Verification has been achieved on two occasions. The plan is to approach 360 degrees over mostly flat terrain, but with Perth itself in the shadow of the 1,000 ft. Darling Scarp. Wally can hear the Mt. Barker beacon, VK6VVE, over a slightly shorter path, most mornings.

Also from the same publication comes news that David VK3QV, Federal Vice-President, has advised that the following new Victorian records have been ratified:

- 430 MHz: VK5ZYO to VK5ZDY, 1/2/70, 406.4 miles.
- 576 MHz: VKA0OT/3 to VK3ZKB/3, 11/4/71, 147.5 miles.

The VK5 Federal Councillor, Geoff VK5TY, announced at a recent W.I.A. meeting in Adelaide that as a result of the I.T.U. Space Conference the allocation to the Amateur Service of 21.000 to 22.000 GHz is to be withdrawn, and a new 24.4 GHz band substituted, with 24.4 to 24.050 GHz as an exclusive allocation, and 24.050 to 24.250 GHz a shared allocation with the radio-location service, which is the primary service. There will be gain with the new band to be had, the propagation characteristics of the new band are considered to be more favourable as it is away from a peak of atmospheric attenuation which occurs at 23 GHz, due to absorption by water molecules. While on the subject of the new band, it is probable that the record still stands for a 21 GHz, 20.5 mile contact of 27 miles between W2UKL/2 and WA2VWL/2 on 24/10/64. For those who are interested, you might care to try and better 22 miles for above 24 GHz, set on 9/2/69 by WEFUFS and WEIJCJ/2.

During the month a copy of "QRN", the bulletin of the Northern Zone of Tasmania, has arrived on my desk. It appears the editor is John VK7TJV, and note with interest in a point where he is commencing to investigate the setting up of beacons for 6 and 2 mx, presumably in the Launceston area. Perhaps we shall hear more of this as time progresses. Membership of the Northern Zone has dropped from 100 last year to 80 this year, which augurs well for the future. Thank you for including me on the mailing list, and I hope to use items which are of general interest from its pages from time to time.

I find with interest that there is to be another South-East Radio Group Convention at Mt. Gambier next year. Garry VK5JR, the S.E.R.G. public relations officer advises the Convention will be held in Mt. Gambier on the 10th weekend in Jan., 11th and 12th June, 1972. As a major sporting carnival will also be held in Mt. Gambier over this weekend, the S.E.R.G. has booked an entire motel. If you are likely to be going to the Convention and require accommodation, it would be well for you to make your booking as early as possible.

The V.h.f. Rally on 19th Sept. at the Gem-brook Sports Ground was apparently a great success according to Bob VK5AOT, who writes mentioning to 80+ Amateurs who turned out amounting to 200 people who joined in the occasion. The weather was fine, and several VK5s made the journey. However, the same good conditions certainly did not prevail for the V.h.f. Rally on 12th Sept. last year. A week later, Bob remarked that conditions were "lousy", but this did not deter 14 stations from going out portable. However, due to the conditions no stations were heard here at my QTH, where it rained all day!

Entries are invited for inclusion in the events column, particularly for a purely local nature. Correspondents are again reminded copy for the Jan. issue is required by 25th Nov., five days earlier than usual, due to the Christmas and New Year holidays period.

The DX section for v.h.f. fast approaches and it seems very likely we will see a continued increase in the number of stations, particularly on 6 m. using s.s.b. It is hoped efforts will be made by everyone to work their stations as much as possible. A. M. is easy to tune of course and suited to many of the older receivers in use on v.h.f. However, a little thought and work to arrange to improve the overall performance will result in greater pleasure while listening. A regulated voltage supply for the mixer and oscillator stage, and the b.f.o., will work wonders in many cases. There are many simple b.f.o. circuits both v.h.f. and transceive, which can be used. A receiver's e.t.h. although a product detector will be better to handle the large signal level variations found on v.h.f. However, do not overlook the common b.f.o. If you have this you will still need to give a CQ call on a.m. stations only!

Remember also that many of the s.s.b. stations will be operating transceive, so it will not necessarily for you to call them on their own frequency. It would be an advantage to do this, and in particular to advise when calling whether they are on transceive. Likewise, it is a good idea for all stations to advise when calling that they will listen on their own frequency before tuning, as there may be a station using transceive there, calling you.

This all means that ultimately v.h.f. operation will follow the pattern of h.f. when almost without exception stations will be transceive on the same pattern of frequency whether they are using transceivers or not—s.s.b. and a.m. stations alike do this, and the practice is already growing on v.h.f. One advantage operators should consider is the fact the form of operation tends to keep the frequency clear for the two or more stations operating. I wonder how many times you have come back after an over to find another station blocking out the one

you were working just because nothing was being transmitted at the time he chose the frequency.

And finally, a word about 2 mx. Evidence suggests it is possible to make contacts for next year for a period of a year or two, we can expect better contacts over longer distances on two metres. It was around 1961 to 1964 approximately that propagation improved to permit more contacts over longer distances, including the record breaking contacts between ZL and VK5. This will occur again, so it will pay all to have 2 mx gear ready, and capable of listening on two while transmitting on one. Should you be unable to make the grade and work Brisbane, Sydney or somewhere else, please be fair and make the contact brief, and clear the frequency for someone else. As anyone knows who has worked DX, the DX session is usually not too long, and someone who is long-winded will spoil the chances of many. It's now in your lap!

The thought for the month: "A lot of today's questions is caused by a simple answers, coupled with a tremendous shortage of simple problems." Until next month, 73, Eric VK5LP. The Voice in the Hills.

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D X

By H. F. EVERTICK

C/o. P.O. Box 36, East Melbourne, Vic., 3002
(Times are in G.M.T.)

News seems scarce this month. That is to say, news which is not out of date by the time you read this. Better winter in the Northern Hemisphere, the DX-peditions are few, and certainly nobody would have a shot at, say, Rockall at this season. But where are the Southern Hemisphere DX-peditions?

Perhaps then, this may be a good time to look ahead. We have become so accustomed to thinking about the bands from 1.8 to 28 MHz, or DX bands from 10 to 28 MHz (or now and again) that they are known simply as the DX-bands. No need for any explanations. Everyone knows what you mean.

In a few years we may have to change our minds. Satellite technology is bound to come along before this decade is finished which will cause us to scrap the term "DX bands" because all our Amateur bands may become DX bands. The development of repeaters in the U.S.A., however, has already caused some changes in satellites. How soon can we expect satellites in geophysical orbits carrying repeaters on v.h.f.?

Will this mean the scrapping of DX certificates? Do we know them? Will it become easier and more reliable to work into Kansas or Kidderminster on a v.h.f. pipe-line rather than through the natural terrestrial methods we use now?—when we can get through! I suppose that the number of repeaters will tend to limit the usefulness of any such system unless there are hundreds of channels available or something else is done.

It is always disconcerting when you talk with old timers just up the street on a "regular" DX band and suddenly become aware of a breaker 2,000 miles away. How much more disconcerting could this be if you were having a telephone-type contact on 2 metres from your car or the roof of your house and suddenly became aware of a breaker opening off to his salt-mine in London! Similar thoughts have been aired in the past but today the reality seems closer. What triggered my thoughts were the Project Australia notes in the article in the December issue of *QARAFW*.

If all that does come to pass, the days of prediction charts might become numbered. Looking through the charts for November the other day, an interesting possibility in speculating how the will work out in the future.

For the short path to London the MUf peak from Perth extends almost to 30 MHz, as against 27 MHz. from Melbourne and 28 MHz. from Canberra, while the Canberra peak is somewhat higher, later in the same time. The MUf dips down into the ALF for all three, but only down to 12 MHz. for Perth as opposed to 11 for Melbourne and 10 for Canberra. Once again, all are at about the same time. However, for Perth, the MUf is much broader than the others—for Perth, the 7 MHz. opening extends from 1420 to 2300Z, for Melbourne from 1330 to 2100Z, and for Canberra from 1330 to 2030Z. The ALF peaks rise to nearly the same frequency (15 MHz.), but for Perth the peak is two hours later than the other two.

Looking in the other direction, it would pay to live on the East coast to work into San Francisco. In Canberra the MUf peaks at 15 MHz. and Melbourne at 17 MHz., both at 0100Z, but from Perth it reaches just over 25 MHz. at 0200Z. The ALF curves are more interesting though. From Canberra the ALF never drops below about 15 MHz. and remains on this level for 14 MHz., whereas for Melbourne it is a dome rising to 15 MHz. at 2300Z with a base extending from 1630-0730Z, and for Perth the dome also rises to 15 MHz., but at 0300Z with a base extending from 0445-0915Z. The dome for the short path to London the MUf band would be open from Perth to W8 from 0600-0800Z and 1500-2100Z, from Melbourne 0400-0900Z and 1500-2100Z, and from Canberra 0300-0900Z and 1500-2130Z. On 7 MHz. the MUf band would be open from Perth 0720-1630Z, and Canberra 0715-1830Z.

Although comparable tables were not available, going northwards of course gives greater MUf peaks—for example, the MUf path Townsville to Hawaii peaks to nearly 38 MHz. at 0200Z, whereas from Adelaide it reaches only 28 MHz. plus at 0400Z.

The long path to London is a complex interweaving of MUf and ALF curves for all three places. However, it would seem important to go to London on 7 MHz. long path from Perth, whereas from Melbourne it would be theoretically possible from 0600-0915Z and from

Canberra half an hour earlier. For closer N-S paths, the possibilities of 28 MHz. DX are better from Perth, particularly on 1F modes as opposed to 2F, but these are more obvious comments.

It was always very interesting to see the prediction charts used in the VK3 Bulletin, as organised by Frank Hine, and by extension to see if there might be another way to display this information. For example, the path to Nairobi for November could be shown thus (local times):

21 MHz.—

From Perth:

-5	1600	+ 4
Melbourne:		
-4	1700	+ 4

Canberra:

-4	1700	+ 4
----	------	-----

14 MHz.—

From Perth:

-5	0000	+ 4½
Melbourne:		
-3	0000	+ 3½

Canberra:

-4	0030	+ 3
-3	0800	+ 3

7 MHz.—

From Perth:

-4½	0300	+ 4½
Melbourne:		
-3½	0400	+ 3½

Canberra:

-3½	0400	+ 3½
-3	0400	+ 2½

2 MHz.—

From Perth:

-4	0000	+ 4
Melbourne:		

Canberra:

-3	0000	+ 3
-2	0800	+ 3

1.8 MHz.—

From Perth:

-3	0000	+ 4
Melbourne:		
-2	0000	+ 3

Canberra:

-2	0000	+ 3
-1	0800	+ 3

1.25 MHz.—

From Perth:

-2	0000	+ 4
Melbourne:		
-1	0000	+ 3

Canberra:

-1	0000	+ 3
-1	0800	+ 3

1.125 MHz.—

From Perth:

-1	0000	+ 4
Melbourne:		
-1	0000	+ 3

Canberra:

-1	0000	+ 3
-1	0800	+ 3

1.09375 MHz.—

From Perth:

-1	0000	+ 4
Melbourne:		
-1	0000	+ 3

Canberra:

-1	0000	+ 3
-1	0800	+ 3

1.0625 MHz.—

From Perth:

-1	0000	+ 4
Melbourne:		
-1	0000	+ 3

Canberra:

-1	0000	+ 3
-1	0800	+ 3

1.03125 MHz.—

From Perth:

-1	0000	+ 4
Melbourne:		
-1	0000	+ 3

Canberra:

-1	0000	+ 3
-1	0800	+ 3

1.00000 MHz.—

From Perth:

-1	0000	+ 4
Melbourne:		
-1	0000	+ 3

Canberra:

-1	0000	+ 3
-1	0800	+ 3

1.00000 MHz.—

6 Metres. From late Nov. to end of Jan., VK3GG of Wauchope in an interesting letter received the late for October "A.R." giving details of contacts with WIBB, the Boy Scouts' 13th World Jamboree at Asagiri Heights in Japan. He is reported the first VK worked by the station and his son, Steven, happened to be there at the time. A good article appeared in the *Scouting Shire DX*. I wonder how the Scout Jamboree on the Air will go this year—here again, details arrived too late for inclusion in last month's "A.R."

Reports: VK4KX of Wauchope in an interesting letter for October "A.R." gives details of contacts with WIBB, the Boy Scouts' 13th World Jamboree at Asagiri Heights in Japan. He is reported the first VK worked by the station and his son, Steven, happened to be there at the time. A good article appeared in the *Scouting Shire DX*. I wonder how the Scout Jamboree on the Air will go this year—here again, details arrived too late for inclusion in last month's "A.R."

July 1971. "A.R." quoted the QSL messages of ILIJ, but Murray quotes IIJ from another source. Perhaps somebody knows the answers to these points. Murray also lists 7ZAB, Box 2486, Dharan on s.s.b. This is a "club" station with many members and operators and has been active for many years.

Murray's lists also include many goodies and 17LMK (c.w., 7 MHz.), FRATAE (t.s.s.b., 14 MHz.), MPEV (c.w., 7 MHz.), GSYCP/MKA (c.w., 14 MHz.), presumably mobile, and 16ZRA (c.w., 14 MHz.) and OB4VE (c.w., 7 MHz., Peru). Murray lists everyone else in complaining about the deadness of poor old 10 metres and listed 40 and 20 as "improving". He also mentioned the QRM on 10 metres, particularly at 7 MHz., but from another source I know he is very active on the Intruder and reporting. This is splendid work requiring many operators, much time and great patience. Those who use the DX bands at night for intra-shuttle and satellite remarks will find a most useful panacea for boredom by listing Intruders which, at those times, are extremely active on 40 and 80 metres.

Darlene in *3B9DKD* may operate from rarer European DX-spots on 10 MHz. as 3A.

May 1971. VK3APJ now suggests a possible activation of VR3 Fanning Is. by WA5DVW and that BV2A is the only present activity in Taiwan (x). controlled 1420Z around 1200Z).

RTTY: "Radio ZS" of July mentions several Eastern Cape stations are preparing for r.t.t.y. on 50 MHz.: ZS2A OW, QC, BZ, GS, GE and DD.

Contest Results: An attempt to connect my entries into the ANPDX contest was successful. VK3DX's 10 MHz. DX notes was, of course, top scorer in Oceania on 14 MHz. This is an all time record. In the "CQ" W.W. DX Contest ("CQ" Oct. '71) VK4READY/9 is listed as the all bands single operator from the world record holder (1967), VK3XPN on 1.8, VK3XNO on 7, VK3APJ on 14 and VK3UG on 28 MHz, all single op., single band, c.w. world record holders with AZ42B, 0400-0900Z, on single transmitter, multi-band, record holder.

In the R.S.G.B. 1971 N.F.D., VK5II/P gained 2nd position in overseas check logs giving G stations 383 points ("R.C." Sept.).

Again from "CQ" of Oct. it is observed that VK4READY/9 has entered the competition in the "CQ" DX Award (c.w., Cert. 57) and joins the CW WPX Honour Roll with 809 prefixes. VK4FHD gained Cert. No. 468 in the phone WAZ and VK3AMK Cert. 861 in WAZ SSB ("CQ" July).

Contest Calendar:

Nov. 8/7—R.S.G.B. 7 MHz. Phone DX. Nov. 13/14—R.S.G.B. 1.8 MHz. DX.

Nov. 27/28—"CQ" W.W. DX—c.w. Dec. 11/12—Spanish c.w. DX.

Dec. 11-Jan. 23—Ross Hill Memorial V.h.f. Contest.

Feb. 12/13—John Moyle N.F.D.

Late Notes: From Charles VK4KX via Paddy 4STPB on SEA on Nov. 14, 1971, daily details of the WIBB DX-AIAA call by the Univ. Rnd Club in Cambodia resulting from John's VE1TR/XU operations; believed approved by A.R.R.L. for DXCC. Also that the ZD5 boys now have the prefix 3D6 as 3D6AX. From VK3UG, 1400-1900Z for WVE, 1907-1912Z for JA, 1836 (approx.) for ZL and 1975-2000Z for JA. VK4KX is 1400-1900Z for earlier to 1600Z and the activity date is Nov. 6, 20; Dec. 4, 18; Jan. 1, 15; Feb. 5, 19.

VAs will be looking for DX from 0730 to 1000Z on the same days. Reports of QSOs are requested and should be sent direct to WIBB, 38 Pleasant St., Winthrop, Mass., 02152, U.S.A. for the Sunday DX news bulletin. Last month this column published details of VK1HGT's activity periods.

Don Granity will be writing the DX notes in future and please forward any copy to him at P.O. Box 222, Penrith, N.S.W., 2750.

NEW CALL SIGNS

JULY 1971

- VK1HDH—H. Daniel, 14 Dianella St., O'Connor, 2061.
- VK2GD/T—A. D. Nutt, 7 Atow St., Winston Hills, 2120.
- VK2OEV—D. J. Terrell, 44 Angophora Cres., Forestville, 2087.
- VK2TK/T—P. J. Carter, 5 Bell Pl., Mt. Pritchard, 2170.
- VK2AEM—A. W. Mothersole, 650 Pennant Hills Rd., West Pennant Hills, 2120.
- VK2BCN—A. Conney, 14/122 Raglan St., Mosman, 2088.
- VK2BEU/I—Abel O'Connell House, 4A O'Connell St., Parramatta, 2150.
- VK2BGM—G. Mulhearn, (Rev.), St. Plus X College, Park Ave., Adamstown, 2288.
- VK2BGO—G. W. Henshaw, 249 Heath St., Albury, 2640.
- VK2BH—H. Henney, 72 Nerrim Rd., Castlecove, 2069.
- VK2BK—The Kings School Electronics Laboratory, Station 1, Pennant Hills Rd., North Parramatta, 2151; Postal: P.O. Box 179, Parramatta, 2150.
- VK2BLN—L. L. Neaverson, 23 Vernon St., Strathfield, 2135.
- VK2BPP—B. P. Pankerton, 1 Kings Pl., Carlisle, 2110.
- VK2BUC—A. Buckman, 888 Forest Rd., Peakhurst, 2210.
- VK2BYJ—J. L. Pages, 61 First Ave., Berala, 2141.
- VK2CAK—K. Warchot, 1/19 Nagle Ave., Maroubra, 2035.
- VK2ZAF—A. Blake, 32 Lynwood Ave., Killara, 2071.
- VK2ZGO—G. Markwart, Hoddie St., Robertson, 2571.
- VK2ZHT—M. S. Hort, 10 Decone St., Barrack Heights, 2528.
- VK2ZZJ—J. Miller, 7 Wakehurst Parkway, Nth. Narraweena, 2101.
- VK2ZMV—R. M. McNaughton, 85 Anderson Ave., Mt. Prichard, 2170.
- VK2ZNI—R. Nimmo, 10 Third Ave., Eastwood, 2122.
- VK2ZNZ—C. B. Moore, Drummond College, Uni. of New England, Armidale, 2351.
- VK2ZPQ—A. G. Angiley, 10 Hinkler Cres., Lismore, 24800.
- VK2ZUT—A. V. Bull, 67 Fernleigh Rd., Wagga Wagga, 2650.
- VK2ZUU—M. S. Horne, 6 Kaling Pl., Cooma, North, 2629.
- VK2ZVX—Wilson, "Greenbank," R.M.B. 16, Millthorpe, 2798.
- VK2ZYX—L. A. Adams, 13 Frederick St., North Bondi, 2026.
- VK2ZYX—J. Colebatch, 17 Mooramie Ave., Wollongong, 2503.
- VK3SF—R. H. Wills, Queens College, Uni. of Melbourne, Parkville, 3052.
- VK3WV/H3—Wireless Institute of Australia, Eastern Zone, 6 King St., Maffra, 3860.
- VK3AGC—R. C. Head, 3 Bourke St., West Essendon, 3040.
- VK3AXO—G. J. Gill, 19 Dorset Rd., Croydon, 3136.
- VK3BCD—E. G. Eggen, 15 Clunes Ross Cres., Mullum, 2170.
- VK3BFA—P. C. McKewan, 247 Princes Hwy., Werribee, 3030.
- VK3BFR—U. H. Shaw, 29 Cecil St., Benalla, 3672.
- VK3BHS—C. L. Wareham, 8 Dixon Gr., Blackburn, 3120.
- VK3BHS—Benalla High School, Barkly St., Benalla, 3672.
- VK3BRB—R. J. Beavers, Station: 11th St., Mildura, 3500; Postal: P.O. Box 32, Mildura, 3500.
- VK3YAA—K. J. Wood, 115 Boyden St., Mildura, 3500.
- VK3YAH—J. L. R. Wright, 2 Nestle St., Surrey Hills, 3122.
- VK3YAK—A. A. Knox, Cr. Angus Ave. and St. Davids Dr., Wantirna, 3152.
- VK3YAR—R. L. Harding, 39 Wood St., Nunawading, 3131.
- VK3YBE—R. J. Ford, 57a Grimsay St., Burndean, 3160.
- VK3YEA—W. Whitehead, 2 Hardridge St., Croydon, 3126.
- VK3YEA—J. H. Stone, 2 Westall Rd., Springvale, 3171.
- VK3YEK—A. D. Armstrong, 196 Stradbroke Ave., Seven Mile Beach, 3550.
- VK3YEY—H. S. Mordallan, Scout Group, Station: Scout Hall, East Beaumaris Community Centre; Postal: 39 Wells Rd., Beaumaris, 3191.
- VK3YGA—R. C. Mayo, 14 Plumridge St., Bentleigh, 3550.
- VK3YGH—R. G. Heyland, 25 Duncan St., Box Hill, 3128.
- VK3YGL—L. J. Brain, 3 Bindy St., Blackburn South, 3130.

- VK3ZXB—M. H. Adnams, Station: 6 Saer Crt., Mildura; Postal: P.O. Box 246, Mildura, 3500.
- VK4QD—P. J. Lindsay, Station: Roper Crt., Yarravonga, Townsville, 4810; Postal: P.O. Box 1251, Townsville, 4810.
- VK4SO—M. E. Munson, Station: 64 Peel St., South Brisbane, 4101; Postal: Box 1513, G.P.O., Brisbane, 4000.
- VK4ZJE—I. T. Chappel, Dungarroll, 4513.
- VK4ZJE—I. T. Chappel, Dungarroll, 4513.
- VK4ZK—R. L. Kenner, 37 Lowerson St., Lutwyche, 4009.
- VK5OW—B. E. Beckman, 5/36 Delprat Tee., Whalya, 3600.
- VK5UT—P. F. Allen, 5/37 Seaview Rd., West Beach, 3620.
- VK5XE—R. Russell, 46 Wainwright St., Whalya, 3620.
- VK5ZJB—J. F. Bothwell, P.O. Box 125, Ceduna, 5690.
- VK5ZKE/T—J. L. Jones, 3/9 Harvey St., Nailsworth, 3000.
- VK5ZLM—L. G. Moffat, 1 Mackinon Crt., North Adelaide, 5006.
- VK6CG—R. C. Crowe, 23 Rosser St., Cottesloe, 6111.
- VK6JR—J. S. Ryan, 23 Ballarat St., Morley, 6062.
- VK6NB—C. R. N. Neubronner, 62 Williamson Ave., Belmont, 6104.
- VK6RH—R. H. Cooke, House 684, Tom Price, 6780.
- VK6RR—R. H. Cooke, House 684, Tom Price, 6780.
- VK7ZQI—L. N. Smith, "Belle Brae," Lileah, 7330.
- VK3DO—D. O. White, 3/287 Wellington Pde., Alawa, 5794.
- VK9BC—N. Boland, P.O. Box 5099, Port Moresby, by P.M.
- VK9HB—H. Schueler, C/o Gulf Fisheries N.G., P.O. Box 929, Port Moresby, P.
- VK3JV—J. Vogel, P.O. Box 3155, Port Moresby, by P.
- VK9ZFD/P—F. Dowse, P.O. Box 301, Rabaul, N.G.

ALTERATIONS

- VK2RL—J. E. R. Burstall, Tropicana Hotel, Australian Village, Rose St., Wodonga, 2550.
- VK2ZM—M. N. Nicholson, 18 Coorong St., South Tamworth, 2340.
- VK2AS—A. S. Lundy, 9 Minamurra Crs., Tamworth, 2340.
- VK2AZA—A. Hayatt, 3TB The Point Rd., Wodonga, 2550.
- VK2ZKD/T—M. T. Clarke, Addition of /T.
- VK3DM—J. R. Godin (Dr.), 15 Myamyn St., Armadale, 3143.
- VK3ZS—T. I. Zemert, 22 Swift Dr., Glen Waverley, 3150.
- VK3UQ—G. R. Foxcroft, 9 Havilah Cr., East Rosanna, 3084.
- VK3UZ—E. J. Parrow (Rev.), Station: 43 Park St., Brunswick; Postal: C/o. Brunswick Post Office, 3056.
- VK3VS—I. L. Griffin, 2 Leonard St., Sunshine, 3020.
- VK3AAV—C. J. Dodd, 6/444 Dandenong Rd., North Caulfield, 3161.
- VK3AYJ—D. S. Smith (Dr.), 172 Eastfield Rd., Croydon, 3126.
- VK3BDG—D. R. Garratt, 26 Parkhill Dr., Ringwood, 3134.
- VK3BDH—D. K. W. Bradbury, Addition of /T.
- VK3BED—R. J. Bennett, 18 Armstrong Crt., Trafalgar, 3844.
- VK3BEZ—Wireless Institute of Australia, Eastern Zone, 6 King St., Maffra, 3860.
- VK3BGL/R2—Geelong Amateur Radio Transistor Group, Station: Bayview, Haines Rd., Geelong, Postal: 5 Kyle Ave., Belmont, 3216.
- VK3YAO—B. A. Butler, 22 Rathmunes St., Fairfield, 3078.
- VK3ZCB—B. S. A. Heath, 40 Albion Rd., Glen Iris, 3163.
- VK3ZQ/P—I. A. Keenan, 94 Dendy St., Brighton, 3186.
- VK3ZVK—N. Hull, 113 Park St., St. Kilda, 3182.
- VK4AK—C. Meady, 1/485 Montague Rd., West End, 4101.
- VK4YL—R. V. Bulman, R.F.D.S. Base, Barkly Hwy, Mt. Isa, 4825.
- VK4ZD—J. McWilliam, 67 Parkside Flats, Barkly Hwy, Mt. Isa, 4825.
- VK4ZFD/T—R. F. Dannerbeck, Addition of /T.
- VK4ZJC—R. J. Cummings, Jeffrey St., Capolaba, 4157.
- VK4ZRD—K. R. Davis, 2 Alkira St., Sunnybank, 4109.
- VK5JN—J. M. Brummer, 57A Northgate St., Unley Park, 5061.
- VK5KZ—P. R. Keddie, 33 Belmore Tce., Woodville Park, 5066.
- VK5QO—L. Sonnen, 25 Russell Ave., Haslewood Park, 5066.
- VK5ZBE/T—H. J. Harvey, 7 Jina Pl., Modbury Heights, 5092.
- VK5ZXY—J. R. Waller, 5/43 Price Ave., Lower Mitcham, 5062.

- VK5ZWW/T—W. A. Watkins, 244 Shepherds Hill Rd., Bellevue Heights, 5050.
- VK6BS—H. M. Stoddart, Postal: P.O. Box 190, Wongan Hills, 6693.
- VK6HS—H. B. Simpson, 3 Vernalen Way, Lesmurdie, 6026.
- VK6ZCQ—A. C. Graham, 15 Webster St., Mt. Barker, 6320.
- VK6ZFD—V. Robinson, 26 Chelsfield St., Gosnells, 6110.
- VK6ZGR—W. R. McGhie, 39 Edgewater Rd., St. Lucia, 6132.
- VK1FBP—M. J. Jenner, Addition of /T.
- VK1LY—T. M. Jenner (thru), Addition of /T.
- VK1TZMS—M. G. Salter, Low Head Rd., George Town, 7233.
- VK1ZRF—R. F. Grant, Old Main Rd., Perth, 7200.

CANCELLATIONS

- VK2ZKL—L. G. Moffat, New VK5ZLM.
- VK2ZMU—A. W. Mothersole, New VK5ZAM.
- VK2ZPC—P. J. Carter, New VK2TK/T.
- VK2VYJ—J. P. Pinner, New VK5VY.
- VK5P—R. J. Pinner, Not renewed.
- VK5SH—M. K. Dunn, Not renewed.
- VK5TK/T—J. F. McCrohan, Not renewed.
- VK5WS—P. Q. Scown, Not renewed.
- VK5XL—R. J. Marshall, Not renewed.
- VK5Y—R. L. Stevens, Not renewed.
- VK3AJA—H. Jupp, Not renewed.
- VK3AMJ—I. L. Arblaster, Not renewed.
- VK3AMM—A. C. Edwards, Not renewed.
- VK3ASW—M. E. Ryan, Not renewed.
- VK3BS—M. E. McNaughton, Not renewed.
- VK3BDS—R. H. Willis, Now VK5SF.
- VK3BHS—U. H. Shaw, Now VK5BFR.
- VK3YDG—G. J. Gill, Now VK5AXO.
- VK5ZBN—R. J. Beavers, Now VK1BRB.
- VK5ZC—C. L. Lewis, Not renewed.
- VK3MZ—G. Abell, Not renewed.
- VK5ZUD—H. P. J. Monola, Not renewed.
- VK3ZK—A. E. Humphreys, Not renewed.
- VK4FS—R. F. Lingham, Not renewed.
- VK4YR—R. D. MacPherson, Not renewed.
- VK4ZPL/T—J. F. Lindsay, Now VK4QD/T.
- VK5BSB—J. Grivell, Deceased.
- VK3EC—G. E. Cameron, Not renewed.
- VK3EJ—R. J. Evans, Not renewed.
- VK3ZAQ—E. J. Whittington, Not renewed.
- VK3ZBS—G. Downing, Deceased.
- VK3ZJO—J. C. Willoughby, Not renewed.
- VK5DS—P. A. Smith, Transferred to Port Moresby.
- VK3JJ—G. B. Burleigh, Transferred to Tas.
- VK5SV—T. B. Clarke, Not renewed.
- VK5XC—C. W. C. Sirl, Deceased.
- VK5ZBP—R. L. Holman, Not renewed.
- VK5ZDN—A. R. May, Not renewed.
- VK5ZEF—R. J. Evans, Not renewed.
- VK5ZFG—G. J. Gill, Not renewed.
- VK5UG—Gove Social Club, Not renewed.
- VK5DT—T. R. G. Hanson, Not renewed.
- VK5FE—F. E. Earley, Transferred to Qld.
- VK3JJ—R. J. Schafer (Rev.), Transferred to Manly.
- VK5RF—Sepas Radio Club, Not renewed.
- VK5WF—W. Frost, Transferred to Tas.
- VK5ZF—D. F. Francis, Not renewed.

LICENSED AMATEURS IN VK

	JULY 1971	Total
	Full	Lim.
VK0	11	1
VK1	86	30
VK2	1435	496
VK3	1307	683
VK4	522	175
VK5	519	227
VK6	367	135
VK7	136	66
VK8	37	12
VK9	86	11
	4226	1352
		6378 Grand Total

AUSTRALIS

Further to the report on page 17 of June "A.R." the complete list of all signs of the Amateurs who worked through the balloon package is shown below. These call signs were taken from the tapes of all four flights and were recorded by Jim VK1ZKC. It is possible that some of these calls have been used in the operation of the balloon. Special thanks go to Jim for his tremendous assistance. The VK1 and VK2s were all flight No. 4 only.

VK1KIVP.

VK1KMF—22V/Mobile.

VK2A—24G/F, SASV, SAVS, SAXC, SCXX, JVX, SYDB, 3YEJ, 3YEK, 3ZBJ, 3ZDN, 3ZDW, 3ZKV, 3ZP1, 3ZKE.

VKA5CJ, SDK, SNZ, SQZ, SZDR, 5ZDY, 5ZK, SZKH, SZLZ, SZMW, SZNJ, SZSL, SZTH.

CORRESPONDENCE:

NOVICE LICENSING

Editor "A.R." Dear Sir,

I feel that the "spirit of wisdom" of VK3RN ("A.R.", Sept. '71) of the comments of his supporter, VK3DH ("A.R.", Sept. '71) concerning Novice licences should not go unchallenged.

It would almost appear from the remarks of these two Amateurs that the world of Amateur Radio to be like an exclusive old gentlemen's club. It is very fortunate for them that they are already members of this exclusive association, but it is unfortunate for the rest of us (brilliant Matriculation physics students excepted) that the doors are kept a little tighter closed than some of us would like.

What about the ordinary, keen, prospective Radio Amateur who has not been lucky enough to gain a place in the University or Technical College via a lower grade licence which he could hold for a limited time? And, if it would seem to you to be such an irreversible process to have a Novice licence, why not agree to have some provision made for operation on the basis as has been suggested by VK3WW and VK4SS? Would not this prove whether the Novice licence had merit or not?

Somewhat considerable comment has been made about the fact that there is no suitable training ground for Novices. As any Amateur in N.S.W. must agree, the portion above 1620 kilohertz is useless for long distance work because of the severe interference from the strong Loran stations in the Philippines, and in the daytime, when perhaps Novices could try cross-town contacts, this band would seem ideal, with interference to other stations at remote points 2 or more miles away.

The radio clubs in this state are always busy preparing prospective Radio Amateurs for the A.O.C.P. Many of the students find great difficulty in passing the examination at the first attempt. Many students fail again and again to gain the qualification which would get them on the air. Some become disillusioned by the complexity of the questions and the very difficult problem of one per cent error. These candidates are over 30. Most of them are brilliant students. But all of them have one aim in common. They would like to gain their Amateur licence and take part in a rewarding amateur sport.

Only those who conduct classes in the many radio clubs can fully realize the frustrations of those who just can't make it. In 1930, was the technical standard of the licence examination at the same level as it is in 1971? Perhaps when you went for your licence Mr. Morgan things were a bit easier. Perhaps in those days they had a syllabus in Leaving certificate physics which encompassed the whole of the requirements for the A.O.C.P. Perhaps did then Mr. Morgan; but they don't do so now. Even teacher members of this club have had to study additional material to gain their A.O.C.P., so how your Matriculation students could accomplish this feat without any preparation whatsoever is a mystery to many of our members.

Surveys conducted by this club indicate that the greater number of members, including those who are already Radio Amateurs support the report on Novice licensing as put forward at the Easter Convention. Our membership is quite large by local standards at over 160, but as I pointed out earlier, many of them are still on the outside. We would benefit by the introduction of a Novice licence and so would the Amateur Service in Australia. The Amateur service will be increased deeply with Mr. Higginbotham's suggestion and, including a Morse telegraphy requirement as has been suggested, we would hope that the increase would be one of quality also.

I trust that this third Radio Amateurs will read the report on Novice licensing prepared under the chairmanship of Mr. Rex Black. I hope that Amateurs will make constructive suggestions as to how the recommendations in the report can be improved. I sincerely hope that the Institute will see fit to give the report its support and that soon we may have a Novice licence. We'd like to partake in Amateur Radio just as much as all your other correspondents, even Mr. Higginbotham and Mr. Morgan.

—E. C. Brockbank, Secretary,
Westlakes Radio Club.

Editor "A.R." Dear Sir,

I read with interest a letter written by Mr. Ivor Morgan concerning Novice licences in the Sept. issue. I am a sixth form student at Bonnall High School and am taking science at the First level. Without at present any provision whatsoever Mr. Morgan? You must be joking!

—R. A. Day, VK2BBL

Editor "A.R." Dear Sir,

I have read with interest Mr. Morgan's letter as published in the Sept. issue of "A.R.". I consider his statement that a boy doing physics at Matriculation level could pass the A.O.C.L.C.P. without any preparation whatsoever to be rather irresponsible.

I am quite a high school teacher of science. I am quite convinced that your correspondent has been misled. The electronics content in the high school physics course constitutes a minute fraction of the mass of knowledge required to pass the A.O.C.L.C.P.

The fact that some high school boys can pass the Amateur examination in radio theory is most likely due to considerable effort on the part of the candidate outside the classroom.

—F. R. Overvliet, VK2ZFO,
Science Dept., Broadmeadow H.S.

Editor "A.R." Dear Sir,

Having read the latest correspondence on the importance of Novice licensing, I should like to offer a few comments from the point of view of an A.O.C.P. correspondence student, associate member No. 9233 of the W.I.A. and a would-be Amateur.

You will remember, Mr. Morgan, decries the suggestion of a lower level Amateur licence and quotes the cases of boys who have passed the P.M.G. Amateur examination on the basis of school physics alone "without any preparation whatever". This statement of course is designed to stress the opinion which he presumably holds, that the A.O.C.P. is within the capacities of anyone with two arms and two legs. I do not know what occupation Mr. Morgan follows and I regard with respect his 40 years of Amateur experience, but I emphat-

ically deny that any school physics course covers the theory section of the prescribed A.O.C.P. syllabus. Such exaggerated statements do nothing to bolster the strength of the anti-Novice cause, which this correspondent is apparently trying to do.

I can assure you and him and anyone else that I should welcome a Novice licence if it could offer me a quicker means of getting on the air to improve my operating skills and give me extensive local contacts. This denies me in my present location. I am remote from other licensed Amateurs and radio clubs, and I should have to rely on advice from well disposed amateur friends and from reference books on the subject. I can see a lot of merit in the position whereby I shall be permitted to start in a small way with a 10-watt transmitter, simple antenna system, and crystal control set down in the novice programme. The Morse code requirement is one which I am quite happy to observe, as I regard this as a traditional and valuable means of communication. I would not be all affronted at the idea of being a Novice. As far as I am concerned, I would be a Novice Amateur and not constitute rather than a Full member, and could well accept the fact that the older and more experienced members would tend to regard me as the other "Novice—an 'apprenticed Amateur'" as indicated in the Novice Committee's report. On the other hand, I should be flattered and pleased if Mr. Morgan and other well disposed Amateurs would accept Novice Full members because of sharing transmitting privileges. Also, I should be grateful to receive the benefit of their suggestions as to how I could improve my operating methods and my technical knowledge.

I do not have a job dealing with electronics, so I find the A.O.C.P. course quite difficult. The small amount of electricity which I studied in my school science course does not take me very far. The involved study papers, while the correspondence course provides, I have considered the system of examining the last few A.O.C.P. question papers, seeing which topics occur repeatedly and preparing "parrot fashion" a limited number of topics, trusting to luck that seven of them



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would appear in the A.O.C.P. paper which I attempted. I realise that the method would offer very limited radio knowledge even if I had survived the narrowly leaping over the 70 per cent. marks barrier. But, if a Novice licence period of operating could be provided, I am certain that the practical work involved in running my own gear and operating would give us a far more useful background than a crash course on a limited number of topics. In other words, I would be a "better" Amateur operator when I finally passed the A.O.C.P.

Mr. Morgan has stated that "the regulations can be learned in one evening prior to the examination". Having perused the specified handbook, I am quite sure that such a cursory consideration of the foundations of amateur operation is most undesirable and I am surprised to think that such an experienced Amateur has such an attitude. One would think that his approach would be towards a long and well-learned preparation on this vital section of the Amateur laws. If I were to pass I get on the air it will be with a sound knowledge of regulations—not merely a hasty sketching to pass a fairly simple test.

I must state that the most sensible contribution to the Novice issue have appeared in letters from Mr. W. J. G. Morris, VK4GSS, Mr. Ouburri, VK3WV, both of whom suggest a trial period of (average) five years. No doubt after this period the Institute and the P.M.G. representatives would consider the success or failure of the experiment and act accordingly. This is a very fair approach to the position.

—Mick Rodden.

Editor "A.R." Dear Sir,

During this week I received from the Federal Manager a photostatic copy of a letter addressed to him and relating to the subject of Novice licensing. This letter was written by a Mr. Iver Morgan (VK3DH) and followed my personal letter to him to clarify and discuss various items relating to the licensing conditions to which he referred. The letter is highly reasonable and friendly in tone and certainly did not warrant the objectionable tenor of his communication. In the event of your deciding to publish his letter, I feel that you might consider printing mine to him, and let our readers measure the nature and content of his statements.

—R. C. Black, VK2YA.

Editor "A.R." Dear Sir,

Count me in on this entrance exam. controversy. I belong to the minority group of genuine Amateurs and Experimenters.

I have had more experience than most with this same exam., having failed it five or six times in a row about six years ago. I could quite easily fail again a couple of times more. It is decided in favour of the high school type of student, while the less educated, slow-writer, aged, or purely physical workers, are all practically debarred.

Down grading is a step in the right direction provided that it is counter balanced by upgrading at the other end.

If we had up-graded both our entrance exam. and our experimental projects in line with the advances in science, we would now have been providing technicians and scientists to the computer and laser industries. Instead of this, we have turned our organisation into a network devoted entirely to entertainment (particularly in recent years since commerce has taken over our exams).

Let us consider this question on a "who gains, who loses" basis.

The "trade" occupies the box seat. In fact for them it will be a real bonanza. The present members will not lose their prestige. This was lost years ago. The experimenters won't be pushed any further off the popular bands. They have already been pushed off.

Let us now consider the sub-standard entrants who are to be entered into our organisation with suitable pleasure hunting bait. The result will be (1) a big increase in the number of pleasure hunters; (2) a proportionate increase in the influence of the "trade" in our affairs; (3) the present abandonment of claims to influence science; (4) the swamping of the scientific section of our organisation through lack of proportionate numbers.

A glance at our award system accurately illustrates Amateur Radio as it is in 1971. The highest Amateur awards go to those willing to spend the most money to get it.

If the present proposal is adopted the position will be much worse. No brains will be required to enter our awards. The entrant has \$500 dollars and some nimble fingers. He needs no brains after he has entered either. The highest awards in our Amateur ranks are within his grasp.

The awards should be commemorated in pictorial form either in a badge or a plaque. It could depict nimble fingers twisting a dial

on a background of a \$50 dollar note. This could be mounted on the back of a crushed "experimental", or hung round his neck like a mill-stone. The foreground could contain suitable "awards" artistically draped, with the surplus stacked in the corner.

The general public will soon regard us as 500 dollar monkeys who are intent on a pina-sure hunt that is free of entertainment tax.

We must all agree that the projected step is fundamentally sound and desirable. It is the side effects that are disastrous. To raise the level proportionately at the other end is not feasible.

I would propose that our experimental section be given more recognition. That they be bonded together in a quasi distinct group (for the purpose only) that this group should abandon the commercialised lower freq. to the pleasure hunters (including themselves).

It should be agreed that the (at least) 144 MHz. band and above it should be recognised as the domain of the legitimate experimenter. Gentleman's agreement on the air lines would probably be sufficient to keep the 500 dollar gate crashers out.

By this method we may hold our experimenters within the V.H.F. even though (like myself) they may be experimenting in the infra red to ultra violet part of the spectrum.

The commercialising of our organisation has separated the "sheep" from the "goats", both intellectually and financially. In a similar manner the proposed method will separate the newcomers. The "newbie" will come to us on the higher freq.—if we are there. If we are not there, then Amateur Radio will be inflicting an act of injustice on that group. Until quite recently the experimental section had to submit to whatever treatment was applied to them. The position has now changed. The science of masers and lasers have opened wide the infra red to ultra violet part of the spectrum. There is no valid reason, under existing circumstances, why the average experimenter should ever be on the Amateur bands. The experimenters are being pushed higher and higher. Automation in the form of modern transceivers have invaded even the 144 MHz. band. We, to hold our experimenters within our ranks, then this band should be held for them.

In the interests of Amateur Radio the removal of injustices to prospective members should not cause further injustice to be inflicted on our own members. I favour lowering

that standard. I believe that there is room for all on our bands. This will not be so if we divide ourselves into the groups "the pushers" and "the pushed".

—A. J. C. Thompson, VK4AT.

Mr. J. Wright of Clifton Hill, Vic., asks why there is so much objection to Novice licensing when for many years the Amateur bands had limited use. Despite the pleas "use the bands or lose them" parts were lost. If there had been such licensing years ago it might have kept the bands open. He feels that if we are not to have Novice licensing, what about updating the exam. paper similar to the New Zealand system of 50 questions with alternative answers for completion in three hours?

Of the two countries having the highest ratio of Amateurs to population, U.S.A. which has Novices and New Zealand which does not, seems to indicate the type of exam. is the reason. The former exam. attracts a larger percentage of technically minded people there than in Australia. He is convinced the New Zealand exam. paper system is better than ours, particularly where the candidate is unversed in the P.M.G.'s present method of examination. His final two paragraphs read:

"In conclusion, I would like to say that it is a pity that the people who have their licences can't use a large portion of their time to listening. 27.24 MHz. can't wait this time to make use of it. I would suggest that the U.S.A. operators on this frequency do the right thing instead of simply rejecting them."

"Perhaps this wasted time could be put to better use by 'intruder watching' the bands that count."

Mr. Ian Loughnan, of Penrith, N.S.W., writes that he is a member of the Y.R.C.S. and is very interested in the possibility of a Novice licence scheme in the hope he can enter Amateur Radio through this channel. Being aware of opposition to Novice licensing he asks why it should not become as good here as in the U.S.A. He hopes to enter the radio and communications field in due course and believes that the Y.R.C.S. studies in operating an N.L. station would be good grounding. Similarly as he has already found that Y.R.C.S. courses have helped him in his school subjects, especially science. He believes he can keep up his school work and still have time for radio as a hobby. He, therefore, supports N.L.

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INTRUDER WATCH

By Alf Chandler, VK3LC, Federal Co-ordinator

At long last tangible interest in the Intruder Watch organisation is beginning to be evident. Reports are commencing to come through, and we will be grateful to receive them and you are very desirable to report them when you hear them, and "that is all the time"!!

The following extract from the U.S. is interesting: "Notwithstanding the frequency agreements, non-Amateur stations will be heard in the Amateur bands from time to time. There is unfortunately an anomaly in the regulations which allows an Administration to assign any station any frequency provided that no interference is caused to any station of another service operating in accordance with the allocations table. In other words, if Amateurs fail to object to interference from non-Amateur stations in the Amateur bands, the Administration can do what it likes, and feel it is complying with the regulations. Enough reports often result in the removal of the intruder concerned." Thus you see how important it is for us to appoint as many Observers as possible.

Another quote from overseas may be of interest: "It happened to catch up to a technician working on other things and arranged for someone to break into their net in order to see what would happen. This was done by carefully zero beating one of the stations and sending a general message to them. The sequence of their operation leads me to the following tentative description of their communication procedure. First is the call-up procedure—WTLA de Y850 HJ—the "HJ" could mean QSA or QSO. Second, after the stations have established contact the term "XH" plus a number indicating the number of messages, "TY" is frequently used in situations which could mean either QRV or QRM. Most frequently it means when the amateurs to have received a part of a message okay."

"The manner of operation is full break-in, and should a station miss a group he will send a series of rapid "R R R" until he breaks the transmitting station. All groups consist of four letters: "NDLB NJKP PLUT" etc. When the amateur receives a group from the transmitting station he asks for fills as follows: "24W"—meaning repeat group 24; the transmitting station then repeats the group and makes a short pause. Should the receiving station wish to repeat the group, a short dash will obtain the desired result. Should persistent interference be encountered the station signals the other by a slow "S" repeated several times. Should the interfering station

sound like one of their own, they will then send "DO", which I interpret as a request to identify. A response using a home-made call similar to their's was made. This was answered in one case by a request to wait—"S"—and when the calling was persisted in breaking their communication they tapped back into the "S" business and began taking evasive action moving up and down without any apparent coordination. In theory such evasive action is permissible automatically in parts of their procedure. When persisted in following in five minutes."

I wonder if this procedure is ethical? It is very interesting though. What say?

OBITUARY

JIM NEIDECK, VK3SAIC (ex W3MEW)

Known to many who are active on the h.f. bands. Jim has been a member both of the W.I.A. and the Eastern and District Radio Club since arriving here in Australia to live over three years ago.

Jim was born in Pennsylvania and lived in the town of Bethlehem, Penna, where he was employed as a Chief Engineer of the Pennsylvania-Baltimore Railroad Co. Jim took part in many early developments of the type system of communication within the railroad organisation.

Later his daughter married and moved to Australia to live. Her name is Laurie VK3AGO. Jim later also moved to Australia and together with Laurie, gave puppet shows to thousands of children in the primary schools.

Jim is considered a great loss, not only to Amateur Radio, but also to all groups who knew him. Jim was a good operator. Jim leaves a wife, Vi VK3BAK, and sister Mrs. Hanson, to whom we offer condolences.

CLIFFORD C. M. COUCHMAN, VK4KZ

Cliff was born near Toowoomba, Qld., in 1907 and passed away at Dalby, on the Darling Downs, on 17th Sept., 1971, after a short illness.

The holder of a Commercial ticket, he first joined the Amateur bands in 1930 and served for five years in the Royal Australian Navy during World War II.

Cliff was on the staff of National Broadcasting System (NBS) Dalby for 10 years, but left to devote full time to his electrical repair business and was widely known throughout the district as "Mr. Fixit".

Although not active on the Amateur bands in recent years, he never lost interest in Amateur Radio. Cliff never married, and is survived by his sister, Miss Jean Couchman, to whom we offer our sincere sympathy.

AMATEUR FREQUENCIES:

ONLY THE STRONG GO ON—SO
SHOULD A LOT MORE AMATEURS!

W.I.A. NOVICE INVESTIGATION COMMITTEE

Since the original Novice Report was submitted to the Easter Federal Convention in Brisbane the following responses have been received from various sources and are submitted for consideration and opinion.

NOVICE LICENSING

Scheme No. 1—

That there should be a range of five grades of Amateur transmitting licences on the following basis:

(a) **Practical Licences**.—No Morse code test; Regulations as for A.O.C.P.; no Theory examination; a practical and oral test on equipment leading to the Third Class Commercial Licence (as issued to operators of fishing craft, pleasure craft and operators on v.h.f. on presumably areas in 144—432)—no operation of v.h.f. equipment to be P.M.G. type-approved and commercially manufactured; limited power is say 5 or 10 watts.

Note: This form of licence would suit those who are "communicators" rather than "technicians". It would approximate to a hobby class of the V.H.F. club, would avoid the rivalry that exists between Amateur Radio and C.B. in U.S.A. and would be granted to the W.I.A. who would not enter the Amateur society under U.S.A. or N.Z. conditions. A special group could be set up within the W.I.A. framework to organise the activities of this group. Perhaps a limited number might be recommended into the licensing conditions—perhaps perhaps.

(b) **Technician Licence**.—Morse code test at 5 w.p.m.; Regulations as for A.O.C.P.; Theory examination at sub-A.O.C.P. level with concentration on v.h.f. techniques. Operation on v.h.f. bands or segments to be determined. 10 watts input, C.W. and r.t. operation. Limited power is say two years.

(c) **Novice Licence**.—Morse code test at 5 w.p.m.; Regulations as for A.O.C.P.; Theory examination at sub-A.O.C.P. level with concentration on c.w. techniques. Operation on v.h.f. band segments to be determined—10 watts, crystal control, c.w. only. No time limit on tenure.

(d) and (e) **A.O.L.C.P. and A.O.C.P.** as at present.

Scheme No. 2—

That there should be a range of three grades of Amateur transmitting licences on the following basis:

(a) **Amateur Operator's Restricted Certificate or Preliminary Certificate**.—Test at 10 w.p.m.; Regulations as for A.O.C.P.—theory examination at A.O.C.P. level in Part A (Telegraphy transmission) section of A.O.C.P. exam. Operation with 10 watts, crystal control, c.w. only, band segments. Two years tenure.

(b) and (c) **A.O.L.C.P. and A.O.C.P.** as at present.

Scheme No. 3—

That there should be a range of four grades of Amateur transmitting licences on the following basis:

(a) **Amateur Operator's Certificate in Basic (or Preliminary or Restricted) Telegraphy**.—Morse code test at 5 w.p.m.; Regulations as for A.O.C.P.; Theory examination based on Part A of the telegraphy section of A.O.C.P. Theory examination marks for passes 50 to 69 pr cent; operation with 10 watts input; c.w. only, segments of (say) two Amateur bands—perhaps 80 and 40, or 80 and 15. Limited tenure for each band to be determined.

(b) **Amateur Operator's Certificate in Telegraphy**.—Morse code test at 10 w.p.m.; Regulations as for A.O.C.P.; Theory examination—70 per cent of marks (or more) in Part A of A.O.C.P. Theory examination—Operation with 100 watts, crystal, v.x.o., v.f.o. to control frequency, c.w. only, use of c.w. segments of all h.f. bands. No time limit on licence tenure.

(c) and (d) **A.O.L.C.P. and A.O.C.P.** as at present.

Note that reference is made to Part A of A.O.C.P. examination. A sample exam. paper to meet this format has been made out and is at present being distributed by Eastern Zone (Victoria) Novice Investigation Committee. This will be distributed as soon as it is returned from E.Z. with commentary.

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South Aust.: Rep.: FARMERS RADIO PTY. LTD., 257 Angas Street, Adelaide, S.A., 5000. Telephone 23-1268
Western Aust.: Rep.: H. R. PRIDE, 26 Lockhart Street, Como, W.A., 6152. Telephone 60-4379

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- Power source: consumption: Battery type 216 or 006P (9v.), 2 mA. max.
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DIVISIONAL NOTES

DIVISIONAL CALENDAR

Listen also to Divisional Broadcasts

- 5 Nov. VK2-V.H.F. meeting; Hunter Branch
7 Nov. VK3-V.H.F. Field Day, 1100-1600 EST.
19 Nov. VK2-V.H.F. meeting.
21 Nov. VK3—Maitland Zone V.H.F. and V.H.F.
Rally at Lake Eppalock
VK5-V.H.F. Group Picnic, Morialta.
24 Nov. VK2-V.H.F. Fox Hunt.
26 Nov. VK2—General meeting.
27 Nov. VK1—General meeting.
3 Dec. VK2-V.H.F. meeting (auction night);
Hunter Branch meeting; Gosford meeting.
5 Dec. VK3—V.H.F. Field Day, 1100-1600 EST.
VK3-V.H.F. Field Day, 0630-1030 and
1230-1530 EST.
11 Dec. VK2-V.H.F. Christmas Party; V.H.F.
Fox Hunt.
12 Dec. VK3—Mt. Dist. Rad. Club Xmas
Outing all day, families. Yarra
Glen.
17 Dec. VK2—General meeting (note third
Fr.)—Gosford meeting.

NEW SOUTH WALES

SEPTEMBER GENERAL MEETING

The Sept. general meeting held on Friday, 4th, at the Hotel New South Wales, George St., Mr. C. Allain, V.KBLCLO, the N.S.W. Civil Defence Communications Officer. Charlie's subject was of course the Civil Defence Organisation. A vote of thanks was moved by P. Healy and carried in the usual manner.

Remember the December general meeting is on Friday, 17th, which is the third Friday of the month.

CONCESSIONAL MEMBERSHIP

That concessionary membership be granted to pensioners and full-time students, provided they make application to Council for consideration by an appointed committee which will consider each application on its merits. The rate will be per month, the fee which normally prevails with the loss of status.

That the previous motion made be retrospective to March, 1971, provided application is made before 30th November.

SEPT. 2 METRE FOX HUNT

The fox was VK2OAO and the final location was at Meadowbank, 1st, VK2AWZ (in after 25 minutes); 2nd, VK2ZGX; 3rd, VK2ZTD. Six cars at start at North Ryde. All hours enjoyed a delicious supper prepared exclusively by Mrs. Lark. Evening finished at approx. 10.15 p.m. (Carl VK2ZGX, Contest Manager.)

NEPEAN DISTRICT AMATEUR RADIO CLUB FIELD DAY, 26TH SEPT., 1971

About 100 persons in all enjoyed the N.D. A.R.C. annual field day in ideal weather conditions. Some difficulty was experienced by the 7 MHz. hounds in the morning, but a re-

run saw Dave VK2AWZ 1st—but still no second place getter. The special event—the smallest portable home-built receiver—was won by Tony for the independent judges (Tim VK2ZTM and Tony VK2ACV) with the multimeter prize going to local club member Leo Michalik. Carl VK2ZGZ did very well with three firsts and two seconds. Congrats to Carl and all other prize winners. Dave VK2ZZN did not do too badly either.

An antique display was given by courtesy of Harold VK2AAH with very old working units of many varieties. Harold's technical quiz of "Jacobs Ladder" was many in for a prize or two seconds.

What happened to the cryptic clue starters? They couldn't find the fox, nor their way back—some arrived back after prize giving at 4.30 p.m. The club hopes that everyone had a good time and will see you all again next year with your friends. Thanks also to many donor firms and the N.S.W. W.I.A. Executive for generous support. (Publicity Officer, N.D. A.R.C.)

MEMBERSHIP APPLICATIONS PRESENTED

GENERAL MEETING, 24/9/71

- Mr. R. Atkinson, 29 Macdonald St., Yarramulla, A.C.T. 2600. Assoc.
Mr. H. W. Buehler, C/o. Gulf Fisheries (I.N.G.), P.O. Box 929, Port Moresby, P. VK9HB, Full.
Mr. G. Dunkley, 8 Chambers St., East Maitland, N.S.W. 2323. VK2ZDR, Full.
Mr. D. Ford, School Residence, Austinmer, N.S.W. 2514. Assoc.
Mr. R. J. Trott, 22 Trebor Rd., Pennant Hills, N.S.W. 2120. Assoc.
Taree OK Youth Radio Club, C/o. G. Hunziker (VK2SGF), 26 Chatham Ave., Taree, N.S.W. 2430. VK2BRC, Full.

VICTORIA

MODIFICATION TO MEMORANDUM AND ARTICLES OF ASSOCIATION

Council has given consideration to proposals aimed at widening members' representation on Council. These proposals have been forwarded to the Division's legal advisers and it is hoped that they may be implemented soon.

MORSE CLASS

A Saturday morning Morse Class has commenced, preparing students for the February 1972 examination. The fees of fees have been decided to give the benefit of worthwhile reductions to both full and associate members. The class is open to all and the fees are:

Full members	\$5.00
Associate members	\$15.00
Non-members	\$25.00

For further details contact the Divisional office on 41-3333.

E.D.P. SYSTEM

The Division's records are being put on an E.D.P. system and your next renewal notice will be made out in this way. It is hoped to effect significant economies by the use of the E.D.P. system for membership records.

LILYDALE CENTENARY CELEBRATIONS

The Eastern and Mountain District Radio Club will be participating in the Lilydale Shire Centenary Celebrations during the week of the 12th to 19th February, 1972. The club intends to set up displays to show off the club's station VK3SER on all bands during the celebrations. This display is part of the club's drive for favourable publicity for Amateur Radio.

A multi-colour commemorative QSL card has been struck for the occasion. Cards with VK3SER will also count as 2 points towards the club's Southern Cross Award (details last issue). (VK3AUI)

SOUTH AUSTRALIA

The Sept. Divisional meeting was well attended to hear and see a lecture by Rex Vinycomb describing the undenominational mission radio station EL2W in Africa. Members observed respect for the memory of Kigman VK5KJL, the old timer quite active until recently with the assistance of Max VK5KGF. Copies of information about Novice licensing were distributed for sub-committee discussions. A short report at the Nov. meeting. Marshall VK5GQZ motioned to go ahead with the swap and shop was carried, details further on. The 23rd Nov. Divisional meeting will hear a lecture from Al VK5SMF on slow scan t.v., a field of experimenting gaining popularity on h.f.

The Nov. V.H.F. Group meeting on Friday, 8th, will be similar to the live t.v. production. The V.H.F. Group meeting (see Div. Calendar) good activities have been planned to keep the odd moments filled for all.

ACTIVITIES

The section leaders in the August VK5 intra-state competition on h.f. and V.H.F. were:

Full licensees, metropolitan—VK5BW.

Limited licensees, metropolitan—VK5ZDK.

Limited licensees, country—VK5ZTH.

C.W. entries—VK5ZX.

Mobile stations—VK5LP/P-3.

Receiving section—O. Sculfield.

All details are in the October journal.

Marshal VK5GQZ has brought an idea from his native Detroit that could prove very popular. His swap and shop proposal is an advance on the standard junk sale auction which have been standard fare in recent years. This idea which has gained huge popularity in the U.S. is for a Sunday afternoon gathering where members can bring good equipment now considered dust, for getting rid of suitable space, to do their own bargaining face to face. The only financial advantage to the Division is a door entry charge proposed at 20 cents per head, and the table space rental fee, again proposed is 20 cents.

Marshal's committee of Phil VK5NN, Arn VK5V and Vic VK5NN have organised the first swap and shop for Sunday, 14th Nov. from 12 noon till 5 p.m. at Symonds Place, Adelaide, behind the Repco building, King William St., which has plenty of parking space.

This will be a most enjoyable afternoon just meeting old friends, maybe the huge snowball it can be, everybody must bring something to sell, so don't leave it to the next chap, that half completed transmitter will be useful to someone. (Bart VK5GZ)

WESTERN AUSTRALIA

360 questionnaires were sent out in February to all members of the Division and 223 were returned, of which 198 were completed. The nature of the replies were most informative. 25 per cent had been members for less than two years, 55 per cent for between two and five years, 15 per cent for over 10 years, 86 per cent did not use the QSL Bureau at all, and of those who did use the Bureau 50 per cent get their cards at Divisional meetings. Nearly everyone believed the Division should have a bank in hand, the majority favouring a kitty of \$500 to \$1,000. The majority thought that the full member subscription should be \$7 per annum, though there was a substantial number who thought the subscription should be \$10 or between \$8 and \$10.

In the listings of how the Division could improve its appeal, the majority thought there should be club premises with facilities, gear, lectures and streamlining business with finishes on time, more newsletters, more good news items and more publicity. Way down the list were specific ideas such as news services on the broadcasts, less sniping at Council, encouraging Y.R.C.S., greater membership and so on.

Full details of the results of the questionnaire were listed in the W.A. Bulletin for July and is an interesting study material.

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VICTORIAN DIVISION W.I.A.

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on

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Programme includes HF and VHF Scrambles, 2 mx Fox Hunt, 2 mx and 80 mx Tx Hunts, Trade Displays, and competitions for all the family. B.Y.O. eats, Barbecue and Picnic facilities available.

Further details from the W.I.A. Broadcasts or Zone Secretary, Bill Clark, VK3FV, High St., Kangaroo Flat, 3555.

FEDERAL AWARDS

COOK BI-CENTENARY AWARD

The following additional stations have qualified for the Award:

Cert. No.	Call	Cert. No.	Call
1395 AX3HE	1401 K4PRT	1408 UK9QAW	
1395 ZLSZ	1402 YU4EEL	1409 UK4WAB	
1397 LU4ECO	1403 ZL3ABC	1410 UK4WAD	
1399 WSDJ	1404 ZL3AAT	1411 UK4WAF	
1399 WSDJ/2	1405 AXAZJ	1412 FRATE	
1400 JA1WVK	1407 ZL3ASY	1413 G3ZY	
1407	UA9ZS		

D.X.C.C.

The following additions have been made to the Australian D.X.C.C. Countries list:

- 3C0—Anphon
- Abu Ali, Jabal at Tair
- Melish Reef

Although operation has not as yet taken place from Melish Reef, credit will be given to any future operation from there.

VKS HEARD ON 160 METRES

The following table is an analysis of VK calls heard on 160 metres in Western Australia during 1970, showing monthly figures, the result of 289 daily checks. All calls were counted once only on any one date. The aggregate total shows an increase over 1969 of 81 per cent.

	VK1	VK2	VK3	VK4	VK5	VK6	VK7	VK8
Jan.	0	0	11	0	3	6	0	0
Feb.	0	0	0	0	4	2	0	0
Mar.	0	0	5	0	4	2	0	0
Apr.	0	0	7	0	2	0	0	0
May	0	0	13	1	10	0	3	0
Jun.	0	0	3	0	0	9	0	0
Jul.	0	4	9	0	11	23	0	0
Aug.	0	4	20	0	11	23	0	0
Sep.	7	0	10	0	12	18	0	1
Oct.	7	7	33	0	9	29	0	0
Nov.	0	7	3	0	8	20	0	0
Dec.	0	0	3	0	3	30	0	0

Totals 14 22 144 1 73 162 3 1

—George Allen, L6042.

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- VK2WF—B. Forman.
- VK2AGH—G. Hall
- VK3AIC—J. Neideck
- VK3ZQR—G. Thomson
- VK4KZ—C. C. M. Couchman

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COMPLETE SSB Station comprising: Heath SB101 Transceiver, \$380, Heath S640 External VFO, \$100, Heath SB600 Loudspeaker, \$20, Heavy duty Power Supply, \$85. Will accept \$550 for complete outfit. 240 watt SSB Transceiver, 20/40/80 mHz, \$175. 900 watt SSB Transmitter, power supply, \$65. VK3TD, Phone 783-9633 or 787-1407 A.H. (Meib.)

FOR SALE: As new Trio TS5100 Transceiver plus matching 240w AC mains power supply and matched linear remote VFO. 5D1000A transistors used, and 160w p.e.p. Suitable for VHF Transverter operation also. This is the latest Transceiver from Trio. Mic and desk stand, connecting leads, plugs, handbook, alignment tool, spare relay and spare set of valves included. Priced for quick sale. S.A.S. Phone or telegram Melbourne (03) 20-4329, VK3ZQQ.

FOR SALE: Collins KWM2 with attached PM1 Power Supply incl. Speaker, Collins MM1 Mike, suitcase inc. \$650. Also \$1900, Heath SB101 Transceiver, \$250. Johnson Matchbox with SWR meter, etc. \$50. Mostley Transistor TR33 1K with motor and remote control, \$90. BC221 with book and service manuals, AC powered, \$35. Take \$800 the lot. Kinnear, Flat 17, 417 Toorak Rd., Vic., 3142, or phone 24-8513.

FOR SALE: FT-40X with matching Speaker, circuit, and instruction book. Unit is just over two years old and is in new condition. \$330. Kyoritsu SWR meter, \$15. Astatic Microphone with desk stand, \$35 (not pre-wired). Also a small ideomicrophone for SSB. For the lot will accept \$800. I. Browne, VK4DB, 32 Duligan St., Cairns, Old. 4870.

FOR SALE: Complete Sideband Station: 300 watt PEP Phasing Transmitter, heavy duty Power Supplies, modified AR7 Receiver, Crystal Converter, 40-20-15, the lot for \$130. VK4NB, 95 Gatton St., Mt. Gravatt, Qld. 4122. Phone 49-4615.

FOR SALE: Linear Amplifier, 30 through 10 metres, 600 watt input 4-4000A, capable of 1 KW PEP and matching PS. Fully metered and safety protected. Forced air cooled. \$170 o.n.o. Contact R. Balfour, VK3B6B, Phone 399-1311 Ext. 454 or A.H. 2 Balmain St., Laverton, Vic.

FOR SALE: MF30A 2 FM Transceiver, 6146 FET pre-amp, 2-channel relay switching, A.W.A. Carphone power unit. Mobile power Robinson and controlling gear. The lot, \$55. Tim Robinson, VK3YBP, 55 Warrandyte Rd., Ringwood, Vic., 3134. Phone (03) 670-5302.

FOR SALE: National NC300 Receiver, 150 to 10 metres, plus VHF Converter bands, Xtal Filter and Calibrator, switched selectivity, etc. Excellent physical and working condition. Price \$195 or best offer. VK2GR, 18 Queens Rd., Asquith, N.S.W., 2078. Phone 47-4344 (Syd.).

FOR SALE: Splendid Grundig Satellite 6001 Portable Receiver, complete, SSB/CW, also normal AM and FM; torch cells or mains powered, as new. \$240. Honda E800E small portable electric generator, good condition, AC 50 Hz, to 1 KW., plus 12 volt DC output. \$120. VK2WPM Transistor Radio, complete, includes 160 mHz average condition, \$275, and mobile \$65. VK3C1F, C/o. Federal Executive.

FOR SALE: Swan 350 5-band Transceiver, complete with AC Power Supply, Speaker, Microphone, Manual plus D.C. Mobile Supply, deceased estate, best offer to G. Sabin, 27 Fishbourne Rd., North Manly N.S.W., 2100.

FOR SALE: Transistor Type Vidicon Deflection Yokes, \$8. Vibration proof, 2nd, 2nds, 1st. (PT) F.C. CRT, \$8. VK2ZB Nine Digit Counter Tubes, \$1.50. Z5055 Counter Tubes, \$1. Contact VK2ZPM. Phone 476-2304 (Syd.).

FOR SALE: Trio JR60 Receiver, excl. condition, \$100 o.n.o. SCR5223 Transmitter working on 2 m AM, 10 channels plus 240v power supply. \$100. MR10C Broad Band Transmitter only, \$5. VK2ZHR, 131 Tudor St., Hamilton, Newcastle, N.S.W., 2303. Phone 69-1498.

FOR SALE: 20WV PEP Multi-band SSB Transceiver, mechanically complete, part wired, \$55. New 9 MHz. Xtal Filter and Carrier Xtas, \$24. AC PSU to suit above and Galaxy Transceivers, \$15, or \$55 the lot. 4B Orchard St., Glebe, Waverley, Vic. Phone 232-9492.

MARCONI AD704 Navigation-Communication Receiver, 100 to 136 MHz, 860 channel capability, about 100 channels and 20 crystals installed of 36 total. Triple conversion, modular construction, 400 hertz, 230v. power supply. Easily converted to 240v. a.c. \$50. Phone 53-1638, Melbourne.

WANTED: A.R.R.L. Handbook, 1955-60 vintage. Phone 358-1039 (Melb.).

WANTED: Band-change motors and L-R Indicator drive transformers to suit 24 volt Bendix Mk20 Radio Compass sets. Transformers are marked T16 or A110. State price required. Also Vintage Radios complete with Horn Speaker, early 1920's good price paid, send details. O'Brien, Edgar Rd., San Remo, Vic., 3023. Phone 107.

WANTED: FL-2000B, FL-2000X or SB-200 Linear Amplifier. Must be in first class condition, by R. K. Lyon, VK6KL, 450 Riverton Drive, Riverton, W.A., 6153.

WANTED: Murphy British Naval VLF Receiver or similar type tuning down to 10 KHz. or lower. R. F. Fisher, VK3B6A, 241 Royal Pde., Parkville, Vic., 3052. Phone (business hours) 349-5931.

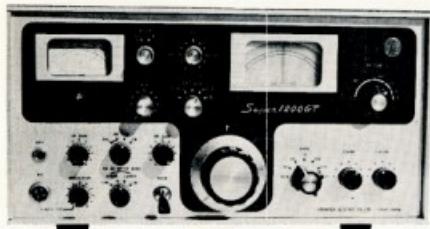
WANTED: Rotary Converter to restore R.A.N. Type S Synchronous Rotator Gap Spark transmitter. Output 70-80 c.w. high frequency gap 500 Hz. Unit will probably have 24 field poles and can be identified by an extension shaft coming out one end for driving rotary gap. R. F. Fisher, VK3B6A, 241 Royal Pde., Parkville, Vic., 3052. Phone 340-5931 (business hours).

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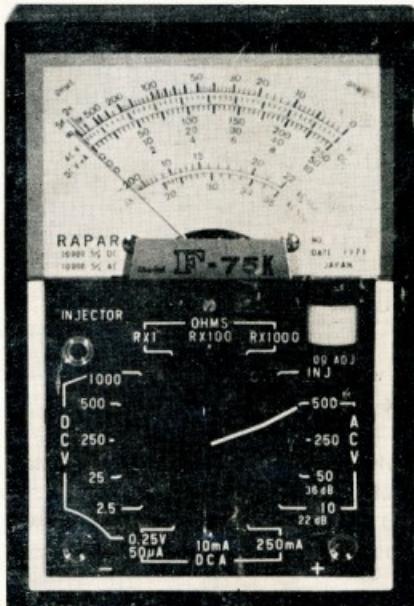
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